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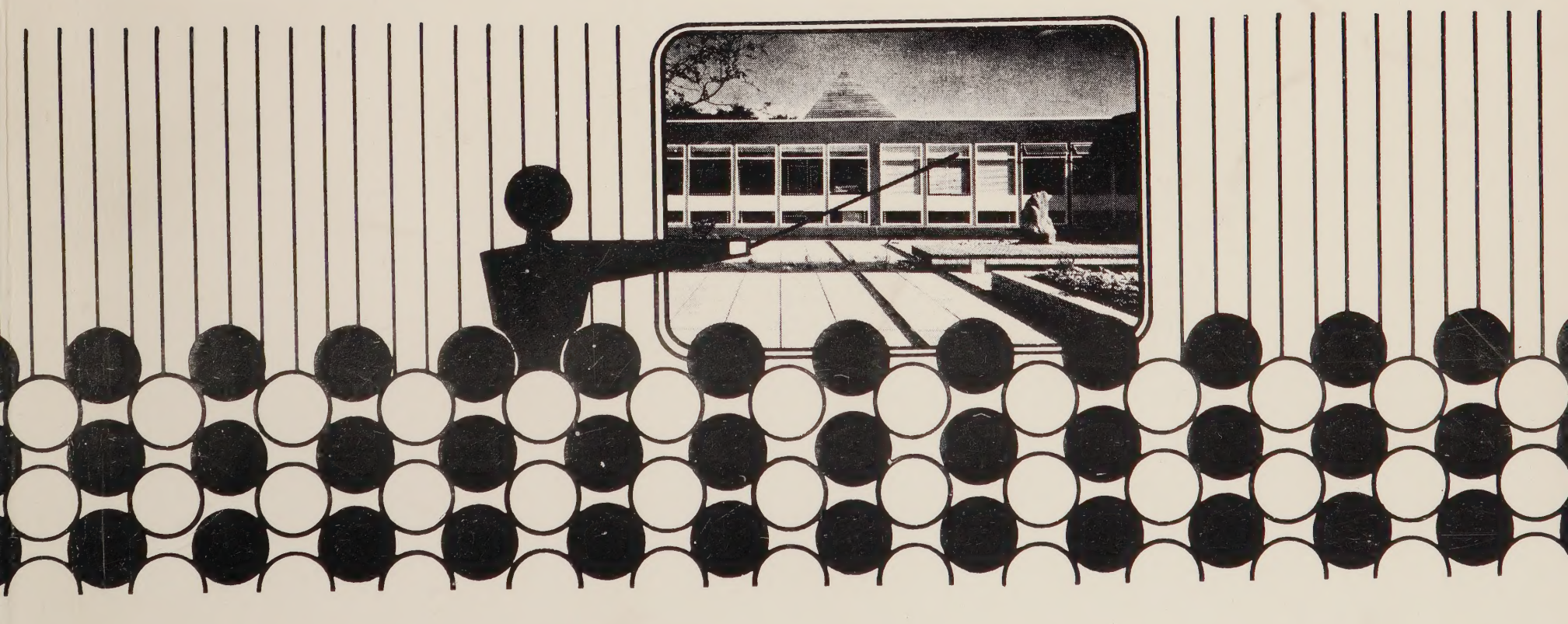

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PREFACE

This booklet, which is the sixth in the series of collected conference reports issued by the Scottish Hospital Centre since its inception in 1 contains information and views on several aspects of the Health Service including new developments with general application to a range of opini and practices of topical interest. Subjects reviewed have covered such matters as the design of buildings, disposable supplies, staffing, medi records and terminal illness. Over 50 speakers presented papers at the sessions and the following reports have been prepared so that they migh reach beyond the limited numbers who can be accommodated in the Centre' conference room.

March 1974

J. R. Y. MUT
Secretary

CHAIRMEN

Professor W F Anderson
Ex-Provost R H Banks
Mr R G Clark
Mr R P Fraser
Dr I M Macgregor
Lord Provost D McL McIntosh
Dame Muriel Powell
Dr J Smith
Mr E W M Watt

MAIN SPEAKERS

Problem oriented medical records - May 1973

Dr N McIntyre, Senior Lecturer, Department of Medicine, The Royal Free Hospital, London.
Dr J C Petrie, Senior Lecturer, Department of Therapeutics, University of Aberdeen.
Dr D H H Metcalf, Senior Lecturer, Department of Community Health, University of Nottingham.
Professor J D E Knox, Department of General Practice, University of Dundee.
Dr M I K Berkeley, Medical Computing Network Project, Aberdeen.

Preparing the Way - June 1973

Dr E Freedlander, House Officer, Glasgow Royal Infirmary.
Mrs R Macleod, Student Nurse, Southern General Hospital, Glasgow.
Dr K E Halnan, Director, Glasgow Institute of Radiotherapeutics.
Miss M Buchanan, Principal Nursing Officer, Royal Hospital for Sick Children, Edinburgh.
Father T Devitt, Chaplain, Glasgow Royal Infirmary.
Dr C Saunders, St Christopher's Hospice, London.
Reverend Dr A V Campbell, Department of Christian Ethics and Practical Theology, University of Edinburgh.
Miss D Boardman, Social Work Adviser, Social Work Services Group, Edinburgh.
Dr W W Yellowlees, General Practitioner, Aberfeldy,
Miss I Campbell, District Nurse Tutor, Aberdeen.

Health Centres and the medical supplementary professions - September 1973

Dr H Miller, Medical Officer, Scottish Home and Health Department,
Dr D M McLellan, Medical Officer, Scottish Hospital Centre.
Miss H S R Anderson, Physiotherapist, Craigshill Health Centre, Livingston.
Mrs J Lusk, Radiographer, Springwell House Health Centre, Edinburgh.
Mrs L M Hamilton, Chiropodist, Health Department, Edinburgh.

Hospital finishes and maintenance - November 1973

Mr T R Scott, Architect, Keppie Henderson & Partners, Glasgow.
Mr C H Harris, Regional Engineer, North-Eastern Regional Hospital Board.
Mr A H Dingwall, Building Supervisor, Ninewells and Associated Hospitals.
Miss H Birkett, Designer, Robert Matthew, Johnson-Marshall & Partners, Edinburgh.
Mrs M G Saunders, Adviser on Domestic and Ancillary Services, Scottish Home and Health Department.
Mr G G Savage, Secretary, Lanarkshire Health Board.

Disposables - November 1973

Dr C Weymes, Medical Director, Western Regional Central Sterile Supplies Service.
Miss E A Meikle, Area Pharmacist, Southern General Hospital, Glasgow.
Miss E A Reid, Nursing Officer, Scottish Home & Health Department.
Dr H G Smylie, Consultant Bacteriologist, Aberdeen Royal Infirmary.
Mr H A Smedley, Senior Engineer, Scottish Development Department.
Mr L M Williams, Treasurer, Lothians Health Board.

The nurse and research - November 1973

Mrs S Bond, Post-graduate Research Student, Nursing Research Unit, University of Edinburgh.
Miss L Chisholm, Scottish Home & Health Department Training Fellow, University of Strathclyde.
Mrs H Abdel-Al, Post-graduate Research Student, Nursing Research Unit, University of Edinburgh.
Miss M H S Hunter, Nursing Officer, Scottish Home & Health Department.
Miss J E D Hill, Nursing Officer, Scottish Home & Health Department.
Miss L Hockey, Director, Nursing Research Unit, University of Edinburgh.

Laundries and topping-up - November 1973

Mr R Maxwell, Laundry Adviser, Scottish Home and Health Department.
Mr T G Clark, Chief Work Study Officer, Eastern Regional Hospital Board.
Mr A G Welstead, Group Secretary and Treasurer, Edinburgh Royal Victoria and Associated Hospitals.
Mrs J M McCall, Principal Nursing Officer, Southern General Hospital, Glasgow.
Mr R Alcock, Treasurer, Grampian Health Board.

Fire in health buildings

I *Detection and prevention - December 1973*

Mr E Humphries, President of the Fire Brigades Union
Mr I Macdonald, Area Sales Manager, AFA-Minerva (EMI) Ltd.
Mr R P Tarkenter, Engineer, Scottish Development Department.
Mr W Blackwood, Engineer, Ian Hunter and Partners.
Mr A Tait, Senior Fire Prevention Officer, South Eastern Fire Brigade.

II *Evacuation and design - January 1974*

Mr T D W Astorga, Regional Architect, Western Regional Hospital Board.
Mrs M G Maltman, Matron, Southfield Hospital, Edinburgh.
Mr M H Dalton, Chief Nursing Officer, Royal Cornhill and Associated Hospitals, Aberdeen.
Divisional Officer T Miller, Senior Fire Prevention Officer, Glasgow Fire Brigade.
Mr J Beveridge, Architect, Sir Basil Spence, Glover and Ferguson.
Mr D Jack, Engineer, Donald Smith, Seymour and Rooley.

Problem oriented medical records

A Scottish Hospital Centre meeting held at the Royal Edinburgh Hospital on 22 May 1973.

The potential contribution of medical records to service, education and research is great. Too often, however, their only use that is recognised is that of an 'aide memoire', but, in fact, appropriately kept records can provide an opportunity to analyse, compare and even predict clinical practice. At this conference the concept of Problem Oriented Medical Records introduced by Professor Weed of Vermont Medical School was explained and discussed in the context of the National Health Service.

DR J SMITH, Deputy Chief Medical Officer, Scottish Home and Health Department, took the Chair.

DR N McINTYRE, Senior Lecturer, Department of Medicine, The Royal Free Hospital, London, in opening the conference discussed the philosophy behind Problem Oriented Medical Records and their great potential as a clinical and educational tool.

He noted that one of the major problems facing the medical profession was its inability to assess the quality of medical care. Standards of care varied widely from the very good to the deplorable and yet almost all doctors would consider that they looked after their patients adequately. This was of course hardly surprising; each doctor would make his judgement using his own rules without any feedback to tell him whether the quality of care which he was providing was really as good as he thought. The lack of feedback was almost certainly a more important cause of poor care than deliberate negligence and correction of this deficit would undoubtedly have a great impact on the quality of the health care system.

The inability to assess how well a doctor looked after his patients had also had particularly serious implications for undergraduate medical education. Other criteria had to be used to decide whether students should be allowed to qualify and, in general, this had to be in the form of an assessment of factual knowledge. Students, ever mindful of the requirements of their examiners, had therefore concentrated on memorising lists of symptoms, signs, diseases, and drugs. They understood little of what they were taught and were rarely capable of analysing clinical or scientific data in a critical or constructive fashion.

Ideally the assessment of students should be related to the objectives which the clinical teachers had set themselves and the present deficiencies were largely due to the failure to define these objectives clearly. Many medical schools, particularly in the USA, now paid considerable attention to the clarification of educational objectives; in general the result was a detailed statement covering the acquisition of knowledge and skills in the many special subjects taught to students during their clinical training. Although this was a great improvement over previous approaches to teaching and learning there were arguments against such a precise formulation of aims and objectives.

Professor Weed suggested that it would be more appropriate to concentrate on broad behavioural objectives pointing out that what a doctor did was not necessarily related to what he knew. It was generally agreed that clinical efficacy depended more on a doctor's behaviour than on his core of knowledge. Few would dispute the importance of thoroughness, reliability, analytical soundness, efficiency, manipulated skills and the right attitudes towards patients as being the right qualities for the good doctor, and it was unfortunate that medical schools were rarely geared to their development. Weed suggested that the POMR might permit correction of this situation as it could be used to promote the development of these qualities and it allowed a continuous assessment of progress.

The key to the POMR was the PROBLEM LIST, an index or table of contents for the notes, in which all of the patient's problems - medical, social and psychiatric were listed. This problem list was formulated from a collection of clinical information which was called the DATA BASE. It corresponded to a traditional history and physical examination but its size and content were not fixed and depended on the doctor, the patient and on the circumstances in which the consultation took place. For any given situation the content of the data base should be explicit as it could then be used for the assessment of behavioural characteristics.

The third section of the POMR was a set of INITIAL PLANS. These were generated for every active problem formulated from the data base and each had its own substructure. Firstly, consideration was given to the collection of more information about that particular problem whether this was needed for diagnosis or for management, secondly, treatment was recorded and, finally, comment was made on patient education.

The last section was made up of PROGRESS NOTES and these too were structured. Entries were headed by the number and title of the problem under consideration and five possible sub-headings were then used: *subjective* - an account of the patient's symptoms; *objective*, in which physical signs and laboratory results were described; *interpretation*, of the subjective and objective information; *therapy;* and *plans*.

Dr McIntyre then explained how POMR could be used to assess the quality of medical care and behavioural characteristics. The student, undergraduate or postgraduate, was told that the quality of care which he had delivered (or was capable of delivering) would be judged from the clinical records which he had written. These should contain the information which he had collected about his patients and, if they were structured as in POMR, they would clearly display his ability to analyse clinical situations and the logic of his actions. The student should be told that he would not be assessed on the basis of his factual knowledge as he would have free access to medical literature. Instead he would be judged solely on the thoroughness, reliability, analytical sense and efficiency with which he was seen to deliver care to his patients.

Thoroughness was assessed from the completeness of the data base, problem list, and initial plans and from the progress notes which would indicate whether the plans had been carried out; reliability by random checks of the accuracy of both the history and physical examination and of the entries which were recorded in the progress notes; analytical sense by judging the logic on which the original plan was based, the doctor's ability to interpret clinical information and the intelligence with which he used medical literature to decide on a course of action. Efficiency

could be assessed by determining the time taken to see a patient and to make a thorough and analytically sound entry into the record, and also in the way the record was organised and kept up to date.

There were many advantages of this method of teaching clinical medicine. Because it assessed behavioural characteristics and not a core of knowledge, it was not necessary to review every record written by a student. Instead, notes for auditing could be selected randomly on the reasonable assumption that similar qualities would characterise his other notes. This type of audit could be used on medical, surgical or specialist firms and also in general practice. It extended naturally to cover continuous assessment of the postgraduate at all levels and its widespread applicability was one of its major attractions.

Educationally the use of the POMR in this way had other things to commend it. Five principles involved in good teaching had been listed by Miller et al (1961):-

1 the teacher must recognise that learning could only be done by the learner

2 learning must be meaningful and should allow maximum transfer from the artificial environment of the medical school to the reality of independent professional life

3 learning must be aimed at realistic goals

4 learning should be accompanied by feedback, ideally in the form of continuous evaluation according to criteria agreed by students and teachers in advance; and

5 learning should be based on good interpersonal relationships.

It could be seen that with the close personal relationship involved in audit all of these criteria were satisfied by the use of POMR.

In writing up his clinical notes for audit of this kind the student would learn constantly as he would have to read about clinical problems in order that he might make thorough, reliable and analytically sound entries into the record. Another benefit was obvious: as the student concentrated on all of a patient's problems when making his initial plans he would become very familiar with the investigation and management of common problems, whether they were medical, social or psychiatric, and would see them in their correct perspective in relation to many of the much rarer conditions which were examination favourites.

In conclusion Dr McIntyre noted that the potential benefit of the problem oriented approach appeared self-evident and the system was much more than a way of facilitating clinical communication. The ramifications were many but it was likely that it would be the educational potential of POMR which would lead to the greatest benefits. There was little doubt that the system would have an immense impact on the future of clinical medicine.

DR J C PETRIE, Senior Lecturer, Department of Therapeutics, University of Aberdeen, noted that invariably there was a certain reluctance on the part of the user to change established habits and in this respect methods of record keeping were no exception. Many discussions of the problem oriented system frequently did not progress beyond the definition of the terms involved because of an understandable defensive attitude towards the present well established systems.

It was of value therefore to consider the problem oriented system at a practical level to demonstrate its potential value. The definitions, methodology and technicalities could then be debated in a more favourable and sympathetic environment.

The traditional ward round by the medical team using conventionally arranged notes was a considerable exercise of information retrieval at each bedside. With problem oriented records this was obviated because each set of notes was prefaced by a problem list which was an index of contents of the record:-

1	Smokes 20/day	Active
2	Cramp	Active
3	Appendicectomy 1915, Intestinal obstruction 1920	Inact.
4	Pulmonary Infarction 1970	Inact.
5	Syncopal Episode	Active
6	Car. Breast (R.T. & Mastectomy 1971)	Inact.
7	Cervical Spondylosis	Active

This list arose out of the information which had accumulated about the patient -

	INFORMATION		INDEX
PATIENT	Presenting complaint	PROBLEM LIST	1
	Systematic enquiry		2
	Physical examination		3
	Family/social history		4
	Risk factors		etc

A problem could be defined as anything which was relevant to the care of the patient. It might be a symptom, sign, investigation, family or social factor. The problem list was kept at the front of the notes at all times, was cumulative, referred to the entire record (and patient) and contained no provisional diagnoses or guesses.

The next stage of the problem oriented record was concerned with the standardised sequence and arrangement of comment about each individual problem, as each problem should have a clear statement of intention recorded. Any user of the record should be able to see the initial plan and follow up notes for each problem.

PROBLEM	Initial Plan	Follow up notes	Discharge Comment

The initial plan for each problem was structured under (1) plans for collection of further information (2) treatment and (3) patient education.

The follow-up notes were written with the headings: (1) subjective (2) objective (3) analysis (4) plan (soap). There should be no padding and any member of the team might contribute.

The problem list was derived from a standard case history within 24-48 hours of admission and, if the problems were clearly defined, they were entered directly by the houseman in the main/master problem list (numbered) kept outside the notes. If the problems were provisional/ temporary/ill-defined, they were recorded in a provisional list (lettered) inside the notes until their final status was evident when the main problem list was updated. It followed that the main problem list was incomplete until the time of discharge.

In order to achieve maximum advantage from the system it was useful to define the minimum information to be collected acceptable for adequate care. If this defined information was collected in every patient, the basis on which the problem list was founded would be clear. It was necessary to decide on the basic information which was required in addition to the facts arising out of the presenting symptomatology, the amount of information varying according to various factors. Standard forms might be used and any positive feature (depending on clinical judgement) might become a 'problem' with a subsequent initial plan and follow-up notes. Once established the problem could not be easily overlooked on the 'problem list'.

All members of the team used the record and contributed to ensuring the accuracy of (1) findings (2) the correct plans for each problem (3) the level of problem definition. In addition, medical students compared their findings, problem definition and plans with the clinical record after each clerking and could thus have frequent self-assessment.

At the time of discharge a most important part of the system operated as it represented the end of the acute hospital episode and efficient communication with practitioners must be achieved. For several years the Aberdeen General Hospitals had been developing structured discharge summaries (including physical findings and laboratory results) and these were well accepted. These had been adapted to the problem oriented system - the main problem list being set out as in the record in a 'chronological' order whereas the comment about each problem (interpretation, progress, plan, patient education) was set out in order of priority for the admission (coding was taken for SMRI from this section).

In terms of communication with general practice it was noted that problem lists compiled by GPs would be most welcome as they offered an ideal vehicle for the transfer of information. Patients also appeared to be impressed by the awareness that each doctor had of all his problems. The information given to him by the doctors was more uniform because of the sub-heading on patient education.

The system would not be taken up by others unless it was seen to work, to facilitate care and to save time, and in Aberdeen the doctors who had used the system would not revert to the old arrangements and took the system with them to other units. Three out of the eight acute general medical units were already using the problem oriented system.

The record provided an index and structured notes. The logical development of each problem improved patient management, communications, patient awareness and the experience of contributing to the record was of considerable educative value.

DR D H H METCALFE, Senior Lecturer, Department of Community Health, University of Nottingham, spoke on POMR in general practice. He noted that the characteristics of general practice were continuity, comprehensiveness and team care. Continuity meant that the GP was involved in the development of health and disease in each one of his patients over a long period of time, comprehensiveness that he dealt with a multiplicity of disease, many episodes of which were inter-related, and team care that decision making was done by various members of the health care team. Information to subserve this must (1) accommodate growth with time in such a way that retrievability did not diminish as bulk increased, (2) facilitate storage and retrieval of different sorts of information for different sorts of care decision making; and by different sorts of care personnel, and (3) provide evidence for quality control. Problem oriented records fulfilled these criteria. Two main areas of difficulty were however encountered by those converting to the system: (1) what goes into the data base and when, and (2) what goes on the problem list.

There did not seem to be much disquiet among GPs of writing up their progress notes under the headings 'subjective', 'objective', 'analysis', and 'plan'. Similarly most people agreed that the plan should indicate what steps were being taken to get further information for problem solving under the problem concerned, and what action in the way of management, referral, diet or prescription was undertaken. The third element recommended by Weed was to put down what the patient had been told and it was generally agreed that this was a good thing.

Certain difficulties existed in relation to the data base. In general practice it was best regarded as a 'patient profile' or 'background information package'. It carried fixed information such as date of birth, sex, previous illness and slow change information such as marital status, address and occupation. For operational purposes it should be on one piece of card which was easily distinguishable from the problem list and the progress notes, easily retrievable and which was not used frequently in day-to-day decision making. When patients attended with episodes of illness, the history of present complaint and a limited physical examination was performed which produced the stock of information on which most of the care decisions about that episode were taken. This was not entered into the background information package, but was recorded on the progress notes.

A problem might be defined as 'a cause for concern by the doctor about his patient's health.' Thus problems noted as 'active' were causes for concern cueing action. Problems which were causes for concern marked 'inactive' were cues for vigilance. Causes for concern would include diagnoses where known; symptoms, signs or laboratory findings which were not yet 'part of' a diagnosis; psycho-social problems and risk factors such as genetic, occupational or demographic threats as perceived by the doctor. It was important not to confuse the problem list with a retrospective survey of past diagnoses.

The problem list should not be used to list presenting symptoms or even all episodes for which the patient came to his family doctor. Many such episodes were acute, self-limiting and carried no further threat, eg

minor lacerations, upper respiratory tract infections. (The doctor and the patient's memory could be relied upon to notice when these two became problems by reason of repetitiveness or significant pattern) People worried about long problem lists. The 'regular customer' could, if allowed to, generate very long problem lists. Also it was inappropriate for instance to put 'Problem 1, ankle oedema, 2, engorged jugular veins, 3, crepitations at both bases, 4, mitral diastolic murmur', when what should be recorded was 'Problem 1, congestive cardiac failure secondary to mitral valve disease'. Similarly Problem 1, headaches and a month later 2, spots before the eyes, and 3, a month later, tension etc should very soon make the doctor re-assess the patient and look for an underlying problem and upon finding this it could be restated in real terms. The strength of the problem list as a cue for action was that the cause for concern was stated in real terms not pseudo-diagnostic terms. If it was known that the patient had hypertension then it should be recorded as such and not as essential hypertension, unless a complete work-up had been done. Unlike the doctrine of Weed with regard to the hospital problem list, the general practice problem list might from time to time be edited, tidied up or shortened.

The idea of restructuring all the records in the average practice record stack was inhibiting. The patients who needed their records restructuring most however were those with multiple complex and difficult problems who saw their doctor frequently. There were easily identified and some preliminary surveys had shown that this rarely exceeded 10% of the practice population, say 250 of the average list of 2,500. The method of restructuring was simple and the job much less formidable than one would expect, since there was invariably a large lack of information in the notes. The exercise not only gave a working framework but also showed where the gaps were in the information.

The common objection to restructuring was the question of time involved. Undoubtedly it took perhaps 10% longer to write an entry in a problem oriented record than in the conventional record. Where the time was saved however was in extracting the information and reading it. Therefore a doctor who read his notes as a basis for decision making would save more time than he used, but the doctor who had lost the habit of using his notes in decision making would not. He would indeed continue to waste time by having to ask the patient for the history all over again!

PROFESSOR J D E KNOX, Department of General Practice, University of Dundee, spoke on the educational implications of POMR. He noted that in 1973 Hodgkin had listed the following use of records in addition to their more traditional service function:

1 retrospective research and analysis of morbidity

2 pilot studies for prospective projects

3 epidemiological checks carried out for others

4 operational research and management

5 undergraduate teaching and postgraduate training

6 preparation of material for publishing

7 providing outside research projects with suitable volunteers or samples of co-operative patients

8 identifying 'high risk' groups of patients

9 preparation of questions suitable for examinations

10 writing a text book of medical practice

Clearly there was a need for more formal approaches to training in record keeping whatever system was used.

The POMR system helped the student to acquire thoroughness, reliability, analytical skills and overall efficiency. The student could begin to see in an ordered framework the inferences to be drawn from recorded facts - how these had been implemented and how the outcome differed from the predictions. Thus by periodic assessment of the completeness of the data base it was possible to check the thoroughness with which information was being recorded.

Weed himself had stated that the formulation of problems was the most difficult part of the system and this arose because medical students needed more help in developing the skills of problem framing and problem solving. This did not necessarily imply the replacing of lectures and learning in the memory mode. They had their place: but something more was required.

Several techniques were available such as the modified essay question which depended on the respondent working through an evolving situation, such as had presented in clinical practice. At various stages he was invited to respond usually with scientifically inadequate data although the situation was sufficiently circumscribed to allow for a limited series of more or less appropriate answers. It then became possible to focus attention on the factors governing the responses and in this way direct attention to problem framing and problem solving.

Another of the advantages claimed for the Weed system was that it was computer compatible. It was feasible to select from the problem list relevant diagnostic labels: it afforded the opportunity for morbidity recording, and while this was already established for the Hospital Service as yet very little had been achieved in general practice.

Two further points concerning the problem list were relevant. Firstly the number of problems amassed in the system. Hodgkin (1973) reported that an analysis of records of 200 adults after 12 years showed that approximately 1/3 had less than 20 problems, 1/3 had 20-30 and 1/3 more than 30, some indeed having as many as 120 problems. Unless a self-eliminating system was built in, the Weed approach could, in the continuity of care in the NHS, become counter-productive. Secondly, to make the most of the educational potential of the problem list it was necessary to develop a classification system for the psycho-social dimensions. It had been pointed out that while a physical diagnostic label had meaning in a predictive sense the knowledge of psycho-social problems was as yet insufficient to allow this prognostic element.

In summary, Professor Knox noted that POMR had wide implications for education and training. There was a need for training in the use of a system which he considered required to be modified before it could be applied in NHS practice. It allowed the under-graduates to measure the thoroughness, reliability and efficiency with which data were recorded and patient care was provided and the system allowed for a long overdue shift of emphasis to occur in medical education away from preoccupation with fact towards highlighting the reasoning process.

DR MURIEL I K BERKELEY of the Medical Computing Network Project, Aberdeen, spoke in the context of computer handling of problem based records. She noted that for computer handling of medical record data it had been necessary to develop special documentation to obtain satisfactory standards. Frequently the discipline required to make the initial recording in the consultation and treatment area was too rigorous and such documents were unacceptable later as manual records. The documents therefore tended to be completed second hand with resulting disadvantages of delay, transcription error and data preparation costs. Weed however with the problem oriented recording system offered to the clinician a documentation standard which was logical and medically meaningful and where all data was organised around the patient's problems from which all other versions were derived. The generalised structure made it applicable across all specialties, all administrative care units and all functions of the health team. The goal was to create a computerised problem oriented medical information system which would allow recording, manipulation and retrieval of all health data for individual patients over an extended period of time. Such a system would include in-patient and out-patient data and allow entry and retrieval of data at any time anywhere in the health maintenance complex. This however presupposed certain major assumptions - that doctors, nurses and patients could be persuaded to this method of operation, that the quality and use of the data merited its storage, that the paper record could be largely dispensed with, that technology could support the extended system and that health priorities permitted the costs to be met.

In the United Kingdom there were three concepts which were currently accepted and which were areas where the computing techniques could be exploited:-

1 the integrated patient record - which stemmed from the need to manage the patient in the context of his total health record;

2 integration of health functions - which stemmed from the need to manage the services in the context of the overall needs, demands and resources; and

3 health information systems which would have to meet all the requirements from local through district to area and national levels.

Computer technology might offer a solution to these problems by data management techniques and communication networks which were still in a developmental stage in the health service.

Considering medical information systems as a spectrum extending from the doctor/patient contact at one end to the national planning level at the other end, Weed's starting point for improved recording at the doctor/patient interface was readily appreciated. Computer applications might offer greater early dividends however by taking problem oriented episode summaries as their basis, while constructing a medical data file in such a way that extension to the full record was possible at such a time as practice and cost permitted.

One could construct a computer file of patient records where each patient had a master problem list which was updated to the most recent health service contact, and episode data organised around those problems which were dealt with during each episode - with a linkage permitting sequences of related episodes to be constructed. The patient's master problem list would be available as the index to the episode data for all members

of the health team. Its availability bridged care location and specialty distinctions and permitted a quick review of the patient's past history either as a hard copy insert to the case notes for a consultation or retrieved on a screen.

Problem labelling of data allowed more relevant selections to be made according to what clinical information was required for a particular consultation and for patient management decisions (eg one could retrieve the history of one problem in terms of pathology, episodes of care, and its chronological associations with other problems in the same patient). At a later stage the doctor would be able to assess individual patients' conditions against epidemiological information accumulated in the file, eg the pattern of morbidity in the community and the natural history of diseases.

In terms of epidemiological use, the insistence that problems be defined to the level of clinical understanding should avoid premature diagnostic labelling with the result that analysis by disease across the community axis should give more accurate disease incidence and prevalence rates. Records with particuar diagnostic entries could then be searched by problem number to trace the evolution of the disease in terms of pathology, associated factors and medical intervention in preceding episodes. Morbidity could be translated in terms of demands on the care system, and comparison could be made of management plans for the same problem in different patients at a finer level of definition than was possible with traditional records. The organisation of data by episodes of care continued to supply the information requirements of administrators but problem labelling should improve the quality and definition of information available to them.

In conclusion Dr Berkeley indicated that some of the currently available computer systems could offer vast storage facilities and could support a wide variety of different applications with speed, flexibility and accuracy. However, computer experiments were costly and had to be considered against other priorities in the health service. A problem oriented approach to medical recording provided a sound logic on which to base future computer applications in health information systems.

DISCUSSION

In the course of the discussion sessions the following were the main points to emerge:-

1 Information recording

It was important for the system to function effectively that only necessary information should be recorded on the problem record. The narrative type note which had long been established in most hospitals should be avoided and junior medical staff should not be encouraged to make additions to records which were unnecessary to the system. New and passing conditions, eg headaches, could be noted as temporary problems and commonly used abbreviations were quite acceptable. Although headings acted as an 'aide memoire' and could be changed if necessary, it was desirable to record definitive diagnoses on the problem lists. The provision of a satisfactory standard classification of terms in relation to diagnoses would also make for more efficient record keeping.

Difficulties could arise in determining whether certain information should be noted on the data base or on the problem list. Here it was necessary for the doctor to make a value judgement as to the level of threat which the conditions constituted to the patient's health. If they clearly would have no effect they should be recorded on the data base, if yes, on the problem list. Borderline cases would inevitably occur. In the ideal situation a standard data base should exist although in practice most could be said to be incomplete. There was no point in collecting information for its own sake and it was essential that each person should decide on the information which he required for individual patients. One had to define the problems oneself and although problem lists could be inherited, it was important to note that all problems did not have to be solved.

2 Patient education

The noting of information in relation to what the patient had been told about his health was particularly valuable in the problem oriented record. To establish optimum patient/doctor relationships it was desirable that each doctor should be aware of what the patient knew. With many however this was not the case. The GP frequently was put in the awkward position of discussing with a patient his condition not knowing what, if anything, he had been told elsewhere or indeed of trying to resolve the situation where conflicting information had been passed on at different times. This situation did not occur with POMR where the doctor could reassure his patient in the knowledge of and consistent with what others had said.

3 General practitioner and hospital problem lists

It was noted that some consideration had been given to marrying up general practitioner and hospital problem lists. Although ideally the hospital version should be adaptable for use by the general practitioner, it was pointed out that in general practice with its emphasis on chronic and long-term disease there was a greater need for a global outlook on patients. The problem there and more so than in the acute hospital situation was to deal with the total person in physical, mental, social, economic and disabled terms.

4 Educational implications

If POMR were to be generally accepted the need to establish a proper educational programme was emphasised. A change in attitude on the part of university teachers was required so that the system was not discredited by being put into practice by those not fully prepared, or indeed denigrated by some without experience of it; a large educational problem was involved. Medical under-graduates should receive training in the system and thereby education in the total care concept of the patient rather than in the treatment of particular diseases. There was a need for a co-ordinated policy which would overcome the present difficulties of rotational training programmes in which young doctors wishing to practice the system were moved to units where it was not accepted. Although, in view of other record systems, introduction of POMR had to be undertaken in stages, the aim had to be for total adoption. The halfway house situation with frequent interchange of staff would only cause confusion. There was also strong evidence to suggest that the

problem oriented record would improve teaching methods, eg by enabling in a short session a student to be assessed in the practical situation for analytical soundness from his patient records rather than by his academic ability on a text book basis.

5 Modifications

Considerable discussion took place as to whether the Weed system required modification for use within the NHS. It was noted that in the United States many modifications were made in different situations but, although there was a tendency for individuals to tailor the system for their own use, it was stressed that the system as designed by Weed did not require modification if practiced in the way laid down by him.

6 Use of computers

The use of computers in relation to POMR was at an experimental stage. On a limited basis it had been possible to perform analyses on groups of patients and it was suggested that there was a tendency to underrate the potential of the computer in this field. The cost had been estimated at 5m dollars for a 700-bed hospital and on a unit basis this was likely to be reduced.

Scottish Hospital Centre
May 1973

Preparing the way

A Scottish Hospital Centre meeting held at the Walton Conference Suite, Southern General Hospital, Glasgow, on 27 June, 1973.

At this conference papers were presented and discussed in relation to the problems faced by patients and relatives, the clergy, health and social work personnel and many others in and after the period of terminal illness.

PROFESSOR W FERGUSON ANDERSON, David Cargill Professor of Geriatric Medicine, University of Glasgow, took the Chair.

DR E FREEDLANDER, House Officer, Glasgow Royal Infirmary, in opening the conference noted that after the nursing staff the house officer was probably the person who dealt most with patients in hospital wards. He saw them practically every day both formally on ward rounds and when going about his ward work or just simply chatting to them. If a patient was only in the ward for a few days a relationship and rapport did not have time to develop but the resident usually got to know well those who had a terminal illness and were in-patients for several weeks or even months. A big danger he faced however in a busy acute ward was that, as he might at times be so occupied taking off blood, filling in forms, writing up new admissions and dealing with emergencies, terminal care patients could sometimes be neglected. Some of the problems that house officers faced in attending to the dying stemmed from the fact that although they were in the front line, as it were, they were newly qualified doctors and had very little experience. A doctor too might well be very proficient regarding the diagnostic and practical aspects of his work but totally lacking in the ability to talk to someone.

Medical students and junior doctors received no training in how to answer questions from dying patients and how to explain the situation to relatives. This ability however could not really be formally taught and some people were naturally better equipped than others - but some advice could surely be given.

It was well known that patients rarely asked directly if they were going to die. However, it was not uncommon for patients to ask why they were not getting better or why treatment was taking so long. In this situation the question arose should one just concern oneself with giving the patient the answer that would help him the most. Leaving the patient completely in the dark about his condition was obviously wrong if he was asking questions. How much to tell him was sometimes a great problem and one which probably most house officers never satisfactorily resolved for themselves. Clearly the 85-year old dying from pneumonia was a very different proposition from the 40-year old man with stomach cancer. The first was unlikely to pose many problems but the second was very soon going to realise something serious was wrong and would require careful handling. Doctors had to try to give the patient peace of mind but of course this was sometimes just not possible partly because the fear and disillusionment which they experienced could not be coped with.

Dr Freedlander then spoke of his own post which involved working with patients with acute leukemia and other malignant blood disorders. Although the general policy in the unit was not to tell the patient the diagnosis, he naturally did ask questions about his illness. In these circumstances the patient was told enough to allay his anxieties about what was happening to him. It was sometimes found however that as time passed and the patient either remained very ill or relapsed after initial improvement, he tended to become afraid and because of this more difficult to handle. If the doctor had said initially that he would soon be well or deliberately played down his illness, the patient very quickly came to distrust and lose confidence in the doctor. Once this happened any effective doctor/patient relationship had been irretrievably broken. Those dying patients who knew they were dying and had accepted it inwardly, although it might never be mentioned, were more easily supported and such people could not help but command one's admiration and respect.

Discussion between each member of the medical staff about the approach to a patient was vital to ensure that he did not receive conflicting answers to the same question from different doctors. A single senior doctor could be delegated the job of answering queries about progress and treatment. Also co-operation and discussion with the nursing staff and other hospital workers was essential. It was surprising how often doctors heard of patients' problems via the nurses since a patient would on occasion confide in a familiar nurse in a way that he would never do with medical staff.

The strictly medical problems of dying patients were, if anything, more easily dealt with. The control of pain in those where it was severe could usually be achieved quite readily. Young doctors felt on many occasions that medical science could do little to cure patients or even delay the disease process but, in the case of patients in pain, morphine and related drugs could do much to alleviate suffering. The fault in hospitals was probably that at times adequate and regular analgesia was not started as early as it should be. Nausea and vomiting could also be controlled but this was sometimes a more difficult problem. On occasions drug treatment of the psychological problems of anxiety and depression resulting from the illness had something to offer.

Apart from prescribing drugs, just as important a contribution made by the medical staff was to ensure that time was made available to talk, comfort and reassure. There was nothing so damaging to a dying person's morale as when at a ward round, for example, the doctors quietly moved past the bed without a word being exchanged.

The resident should also ensure that the relatives were kept adequately informed about the patient's condition. Quite often they might be reticent about asking to see the doctor and they must be made aware that he was willing to see them. Explanations should be simple, direct and the prognosis given. Also some relatives were keen to take patients home to die when it was clear that domiciliary care was far too demanding and full hospital nursing care was required. This should be quietly explained and, if at all possible, relatives dissuaded from this course of action. In conclusion Dr Freedlander noted that a house officer had a busy job but a few minutes spent in the ways mentioned were just as important and could be just as rewarding as being scrubbed up in theatre or making a diagnosis.

MRS ROSEMARY MACLEOD, Student Nurse, Southern General Hospital, Glasgow, spoke of her experiences as a trainee nurse dealing with problems of patients in terminal illness. She noted that it was not uncommon, as with many of the lay public, for young nurses to regard hospitals only as places where patients were cured due to the efforts of the expert doctors and nurses and their ultra-modern equipment. This of course was only a pre-conceived notion and it did not take long when working on the ward for the illusion to be dispelled. For the very junior nursing staff the first experience with death could be quite traumatic and, although in the first few weeks of training instruction was given in relation to last offices procedures, this was only a paperwork exercise and the nurse had little indication of how she would feel or cope with the situation when it arrived. Even with further training and experience the nurse could still continue to be stunned when confronted with the death of one of her patients.

For the junior nurse, the problem of the patient who asked if he was going to die could be relatively easily dealt with by referring the situation to the senior nurse in charge while possibly at the same time discouraging the patient from talking of such things or reassuring him that it was not the case. One could indeed become quite 'accomplished' at evading the truth when talking to a patient who was suffering from a terminal illness. If it was thought, for instance, that the patient really wanted to be convinced that he was getting better, he had to be assured that his fears were groundless and that treatment would eventually take effect.

If it appeared, however, that the patient genuinely wished to be told the truth, and it was probably much easier to convince hin in this way, then the matter should be referred to the medical staff who would deal with the situation in conjunction with the social worker. Clearly as one became more senior in the nursing profession the situation became more difficult and had to be dealt with more profoundly.

It was also most important to maintain a cheery atmosphere in the ward situation. Where there was a dying patient present, the other patients should be encouraged to think that he was going to recover and any patient unduly worried that his condition was similar to his fellow had to be convinced that his illness was not quite the same.

Undoubtedly in some cases relatives could be a bigger problem than the patient himself. It was not uncommon for many to refuse to believe that the patient way in fact dying and in these circumstances it was necessary to refer the matter to the medical staff to discuss the likely outcome of the illness. On the other hand for some relatives and for selfish motives death could not come quickly enough. Breaking the news that a patient had died was the worst task a nurse had to perform as she genuinely felt sorry herself and fully realised the sorrow which this was going to bring. Here the junior nurse was very aware of her youth and her sometimes consequent inability to impress upon relatives her real concern in the matter.

It was of the utmost importance for nurses to the best of their ability to prepare both patients and relatives for the outcome of terminal illness. Most managed to do this very well but it was probable that more could be done in the way of basic nurse training to alleviate the young girl from the sheer terror which she undoubtedly felt when first faced with the problem. It was a human situation highly charged with emotion and in consequence it was very difficult to suggest anything which would make the problem easier. However more emphasis might be placed on preparation for all the strains involved in a patient dying, on preparation to handle one's

own emotions and on preparation on how to handle the emotions of relatives. In this connection if the junior nurse were allowed to be present when the sister was discussing each situation with relatives then perhaps the trainee nurse might be better prepared to "prepare the way" for others.

DR K E HALNAN, Director of the Glasgow Institute of Radiotherapeutics, discussed his experiences dealing with the problems of the terminal patient suffering from cancer.

He noted that all cancer was in fact not terminal nor indeed a sentence of death. One third of all cancer was curable and for the rest some help, albeit of a temporary nature, could be given. In relation to radiotherapy there could be said to be two objectives - cure and palliation and at least half of the work of the radiotherapist was curative. Two key words to all his work were fear and truth - fear of cancer and pain probably more than of death and truth being very difficult to impart. It was important to be precise as one could on the definition of 'terminal' phase. This was taken as being likely to die within two to three months and when using the word "terminal" in relation to a patient it was important that as far as possible he was in this category. Such classification could be difficult since with present treatment resources the outlook was only rarely hopeless. Age in itself did not rule out potentially helpful treatment for it was relevant to note that the expectation of life at 60 was 17 years, at 70 was 10 years and even at 90 was still 3 years. For the doctor, therefore, it was always sensible to call in a second consultant opinion when in doubt as to methods of treatment.

In the treatment of the terminal cancer patient a sound psychological approach was essential displaying a respect for the patient's courage and strength. For the doctor it was in most cases desirable to tell the truth correctly but gently with the proviso that "we can all be wrong sometimes." It was also most important and rewarding to take longer with the chronic incurable patients than with 'interesting','new', or 'curable' patients.

In the case of treatment specific for cancer in terminal care, chemotherapy was rarely applicable but radiotherapy was frequently employed often for palliation in regard to specific symptoms, eg pain from bone deposits or headache and vomiting from brain metastasis. In relation to general care analgesics should be regularly and generously prescribed and the situation should not be allowed to arise where they were requested or awaited by the patient. It was essential that pain should be eliminated particularly in relation to bowels and bed sores. Drips, tubes and transfusions were usually not necessary.

There were three situations in which care could be given - hospital, special unit (Marie Curie etc) or the patient's own home and for each case the most appropriate depended on a variety of circumstances. It could be said that all had special advantages and disadvantages.

What to tell the patient and his relatives was one of the most difficult problems for the doctor. Dealings with the relatives were possible the easiest in that it was probably advisable to let them know the whole truth in an honest but not too hopeless way. The more important and difficult task lay in relation to the patient. Here interpretation of the word "cancer" and the connotations which had been misguidedly ascribed to it

presented problems. Cancer itself did not mean pain, ulceration and horrors and there was undoubtedly a need for better public education to make clear that it did not inevitably imply death and to indicate the positive treatments which could be given for the condition. It was always important to leave a thread of hope for the patient and important to remember that in doctor/patient discussions listening was often for the doctor as important as speaking.

In conclusion Dr Halnan stressed the importance of not giving up hope or treatment too early. Incurable patients often required more care and attention than the curable and it had to be appreciated that cancer meant different things to patients and doctors. Above all in discussion and treatment the patient's best interests must clearly come first.

MISS MARION BUCHANAN, Principal Nursing Officer, Royal Hospital for Sick Children, Edinburgh, discussed her experiences in nursing children, many of whom were fatally injured in road accidents or with malignant tumours of the brain and spine. The death of a child in hospital was in most cases difficult to accept. The dying child affected so many people and yet appeared to make few demands. For a child to die in such circumstances, surrounded by 'lifesaving' machines and medical and nursing expertise, feelings of anger, frustration and helplessness were frequently generated in the nursing staff. Guilt was often felt and this manifested itself in the form of a hostility towards the parents - a feeling that they were blaming and expecting too much from the staff and certainly more than they were able to give. There were not usually any problems in actually nursing children nor with the dying adult in the neurosurgical unit. These two groups had much in common, the neurosurgical patient frequently having brain damage and a consequent loss of awareness and few children being aware of approaching death.

The death of a patient was part of the pattern of hospital life. Most nurses were aware that this would happen to one of their patients sooner or later and they were in some ways prepared although perhaps inadequately. There was nothing in training however to prepare one for the trauma of trying to meet the needs of parents whose child had died or was dying. Parents frequently did not wish to believe that there was no hope for their child and, for the nurse, a rejection by relatives of what they did not wish to hear was often a new experience. This again could give rise to feelings of hostility that the parents should make it so difficult for the nurse when she disliked giving such news to them. One learnt by experience when to advise relatives to leave the bedside and go home to rest and when it was wisest to leave them alone. There were relatives and parents to whom platitudes and euphemisms were an understandable and acceptable means of communication although one might not find it easy to use them. There were, on the other hand, those to whom such expressions were completely intolerable and one developed perhaps an instinct for what was appropriate. There was no magic formula, one learnt to be receptive to any clues or signals of distress and one tried to anticipate the needs of those in distress. Empathy with rather than sympathy for the parents was developed through time.

One learnt when to make decisions for parents and perhaps help them to overcome their feelings of guilt and inadequacy. The rejection of the bad news about the poor prognosis, for example in children with cystic fibrosis, could and frequently did persist to the very end and even then parents might say "I did not know - nobody told me".

There was a ritual surrounding death in society and in hospital and so often relatives and parents did genuinely wish to see the patient after death. But there were many to whom this was a final and unbearable strain and they would endure this ordeal only because they thought it was expected of them and they would be found wanting in some way if they refused. This was a situation in which one could reassure and relieve many anxieties without passing judgement.

These were aspects of nursing care which were extremely difficult to teach and it was essential that the nurse should be in the learning situation as far as possible without intruding on grief or privacy. Time unfortunately was against this method, the 40-hour week, the wider basic training with its scattering of students and the physical needs of other ill patients had to be considered. Nevertheless a ward sister could impart a great deal to the student nurse by example and should take every opportunity to do so. This kind of contact made the death of the patient and the grief of the relatives easier to understand - though not necessarily easier to accept.

FATHER T DEVITT, Chaplain, Glasgow Royal Infirmary, spoke on the pastoral and spiritual needs of patients in terminal illness and also of their relatives when visiting hospital.

Doctors spent much of their working hours with people in failing health and with dying patients and their relatives. The abstract notion of death might be of academic interest in the medical schools but the reality of death was what confronted the doctor, the nurse and the hospital chaplain. Medical schools might rest content in accepting and presenting the mere biological view of death and, if such were the case, more was the pity. The doctor, nurse and chaplain could not operate within such narrow confines.

Death was a natural but very harrowing event and it was most important to remember that each patient apprehended his death in a unique way. Everyone had the duty and the right to prepare for the moment of death. Unless it was clear that a terminal patient was already well prepared as regards his spiritual and temporal affairs, the doctor had a professional obligation to inform the patient of his situation as fully as he reasonably wished to know. It had been written:- "the truth of the real situation was usually withheld from the patient and this misrepresentation about his condition involved him in a game of deception... if there is any honour left in his life and any dignity in his dying, should not the patient have the right to make a choice for himself about his destiny on the basis of truth." If a patient really and sincerely wanted to know the situation and it would not be injurious to him, then it would seem that there was a strong case for the doctor to tell him. Much of course would depend on the character of the patient. Some would cling to any vain hope, but the doctor could reveal the gravity of the situation step by step according to the patient's ability to cope. Gradually it could be brought home to the patient that all was not well, that every treatment would be used but that it would be well to be prepared and to attend to their spiritual and temporal affairs, eg by making a will. The doctor would of course not relent in his efforts to inspire or strengthen the patient's will to live and nurture the hope of recovering health since hope was a potent factor in the fight against death.

The doctor and the nurse served patients of varied beliefs. The Christian doctor and nurse could be indifferent to the Christian's outlook on life, death and hereafter. Even for the doctor who did not share his patient's religious beliefs however it was of paramount importance that he was aware of the hope and faith of his Christian patient.

The Catholic hospital chaplain had special problems. Often he was regarded as a harbinger of death. It was the Church's view however that a great number of patients who had received the Sacrament of the Sick should recover from their illness. One of the primary purposes of the Sacrament being recovery then it should be administered while recovery was reasonably possible - one should not expect it to effect a miracle.

Everyone wished to assist the patient in achieving a 'peaceful death'. Many would agree that withholding the truth achieved this for the patient but, on the other hand, there were others who believed, from practical experience, that some patients gained peacefulness and moral strength when they were told frankly though gently of their condition as they approached death. This raised another problem facing the chaplain, namely that which resulted from a lack of communication between doctor and chaplain. The doctor had a professional obligation to inform the patient of his situation as fully as the patient reasonably wished to know. But as often as not the chaplain due to a lack of communication did not know whether or not the doctor had in fact done so. As had been said, "Never under any condition should patients be told untruths. This was the surest way to destroy the mutual trust and respect which in the end might prove to be the most important therapeutic asset the physician possessed".

DR CICELY SAUNDERS, St Christopher's Hospice, London, who illustrated her talk with slide photographs, said that in the conference title "Preparing the way" the "way" being talked of was not merely the way towards death but the way to something else, towards being real people, whether it be a patient or a member of a family or one of the staff.

People mattered as individuals but if they had a terminal illness they were rarely told the diagnosis if it was malignant. If they suffered from cardiac, respiratory or even neurological disease they were much more likely to be involved in discussions concerning these diseases. Terminal patients were discussed as "The Dying", they were not involved in discussions about treatment or what was to happen with the family. Their way was extremely lonely as they became increasingly isolated.

The "terminal" stages of cancer could be defined as the time when all active treatment became increasingly irrelevant to the real needs of a particular patient. Sadly it could also be defined as beginning at the moment when a doctor said "There is nothing more to be done" and then began to withdraw, more or less subtly, from the patient. There was a failure to understand what dying patients really expected of the health team. The patients were commonly too realistic to expect that any member of the health team could take away the whole hard thing that was happening to them, but they did ask for concern and care for the distress it was causing them. Above all, they asked for awareness of themselves as people. At no time in the total care of a cancer patient was this of greater importance.

Much needed to be learnt and taught before there were proper standards of relief which enabled a patient to *live* until he died as well as to die peacefully, that helped him to live as himself and not as an "uncomplaining residue". People needed to be concerned with the quality of living, and care, even though it ended with the patient's death, and to be both positive and important in its own right.

The perennial question "What to tell a patient", was central to all the problems of patient management. The problems of giving a diagnosis of cancer or of warning of a poor prognosis were two different things, although

not necessarily so in the mind of the patient or his family. It was more often the prognosis that patients wished to discuss and therefore the term "cancer" should not be used gratuitously. Sometimes patients introduced it and when they did or when there was reason to suspect that it was in their minds they should be quickly reassured that this did not necessarily mean incontrollable pain, either directly or indirectly.

It was sometimes said that patients did not want to ask questions - it was more true that doctors did not want to answer them. Patients did not ask when they knew that they would not get any answers or merely the barrage of reassurance that was aimed more at the feelings of the doctor than at those of the patient. As some staff could never bring themselves to talk with patients of these matters perhaps there were others who both could and should be doing so instead. The care of a dying person must always be the work of a group, not just one omnipotent individual.

Not every patient wanted or needed the whole truth, but what he was told should be true, even when expressed in the most gentle way possible. Once he found out that he had deliberately been deceived he would feel totally deserted - alone with the truth that others had persuaded themselves they had hidden from him. The best communication was often indirect, and deep understanding never needed to be expressed in words at all.

The human capacity to hold two incompatible truths at the same time, to talk about one at one moment and the other the next, to make unrealistic plans or in other ways to relax the tension, had to be recognised. A patient did not always wish to be concerned with solemn matters and staff in these situations had to keep in touch with his constantly changing needs. They also had to recognise those who denied the reality of what was happening or who never wished to have it confirmed in words.

In coming to terms with the situation of terminal illness the dying should be kept in the centre of things and should be involved in the making of plans, in the care of the children of the family and, as far as possible, in the life they had always led. The full life with all its satisfactions was easier to leave than the empty one, and the dying needed to know that they were needed, that they could still give something and that they still belonged.

The short visit by a member of staff which could be relied upon was often of more value than the infrequent longer call. Above all terminal patients should never be passed by - they were deeply wounded by being omitted from a ward round. Depression could go sadly unrecognised in a busy ward and might well respond better to the relief of a narcotic - cocaine mixture than to the anti-depressent drugs. It was lifted by all kinds of physical relief and, once again, by the listener. Those who met these patients were constantly impressed by their admirable courage and realism and sometimes by the unquenchable individuality which could greatly add to the humour of a ward, if not always to its calm.

Mental distress was often linked with physical problems. The fear so commonly caused by dyspnoea, the depression that accompanied anorexia and nausea and the feelings of guilt aroused by incontinence were all eased by treatment of the physical cause. While ingenuity and persistence was necessary to achieve this, the patient was greatly helped if he could be reassured that many of his feelings were physical in origin.

Much of a doctor's work with dying patients was concerned with the relief of physical distress. Pain and the relief of pain were both self-perpetuating.

Patients with constant pain that was typical of terminal cancer needed their analgesics carefully balanced to their needs and then given regularly. Thus drugs could be used to prevent pain from occurring rather than to control it once it was present, already exacerbated by fear and tension. Patients given analgesics regularly did not have to ask continually for the next dose and so be reminded each time of their dependence upon it and upon the person who gave it to them. As their physical dependence increased the aim should be to give them all the independence possible in other spheres.

Narcotics were still the drugs of choice for the relief of severe terminal pain and if their use was properly managed they would maintain their usefulness over long periods. Tolerance and drug dependence were too often due to faulty management by the doctor. More research was needed into the control of chronic pain to ensure that patients were neither swamped by distress nor smothered by treatment or the miseries of dependence.

Alcohol also had an important place in treatment. It was often the best sedative for the elderly and should also be employed for the opportunities it gave for social exchange. Man was a social being and would still find gratification in being convivial or in a relaxed moment with family or friends. At St Christopher's drinks were "on the house" to patients - but not normally to staff. However, there were times when this kind of meeting could successfully be included in a professional relationship, perhaps giving a patient the only opportunity he had of relaxed interchange with another person.

Death from cancer in hospital was not always as peaceful as it should be: staff needed to discern the time when the proper treatment of a haemorrhage was morphine and when a tracheotomy should not be performed. Dehydration was best prevented by the unhurried favourite drink and the family might then be able to help instead of having their distress increased by feeling useless and in the way. A multiplicity of tubes might give no help and only detract from the proper dignity of dying.

Patients in terminal illness needed help of different kinds but it was important to know that what was being done was both relevant and helpful to them. Patients moved from the fight to live into the acceptance of dying - a positive attitude quite different from an apathetic resignation. If staff failed to go near them they might never see this. If they did, it could change their whole attitude to the situation and to the people in it. What they would learn came through the patients themselves and they would have to help students to look for this.

In conclusion Dr Saunders said that for some the preparing of the way - and being accompanied along it - was God's doing. For others it could be done as part of a salute to the dignity of man. The two were not incompatible and some would say they go together. Those concerned needed to do what they could, all needed to be learning and questioning all the time - patients - families - and the caring professions.

REV DR A V CAMPBELL, Department of Christian Ethics and Practical Theology, University of Edinburgh, noted that in our pluralistic society there could be no guarantee that Christian ethics would carry meaning and help for either patients or staff. Moreover, the tradition of Christian ethics was a very diverse one and the themes he raised would be presented from only one particular strand in the tradition.

Man was both free and responsible

Medical advance was a prime example of man's freedom to alter the natural conditions within and around him but it was a freedom that demanded responsibility. Christians believed that their bodies and the world they inhabited had been given to them in trust. Hence there had to be limits to technology according to what they believed God wanted for their lives. This had direct relevance for the care of the dying, when "heroic striving" to keep patients alive would not always be what was called for. To die need not be the worst thing that could happen to a person and the obligation to maintain life at whatever cost to dignity had never been one held by Christians. In traditional moral theology this was expressed by the concept of "extraordinary means" - medical endeavours which one might responsibly choose to abandon out of respect for the worth of the individual being cared for.

The intention was more important than the outward act

This theme related to many of the dilemmas of terminal care. Two situations in particular might be singled out: the giving of information to patients, and the control of pain. In the first of these, the essential question was: with what *intention* was the information given or withheld? Was it to protect the staff from the discomfort of discussing death that they dodged patients' questions? Was the information given the most convenient administratively or was it the most beneficial (so far as one could know this) for the patient and his family? When intentions were the key factor, neither consistent evasion nor insensitive communication of 'the truth' would be the appropriate response.

The same emphasis on intention was important in the case of pain control by drugs which might shorten life. The argument that the giving of such drugs was a form of mercy-killing (an argument often used by advocates of voluntary euthanasia) was fallacious, provided the intention of the doctor was simply to control pain. When the giving of opiates was part of a carefully planned treatment programme for allowing a peaceful death, then prescribing such drugs was not killing the patient. The intention of the doctor was shown by the fact that the dosage was commensurate with pain control, not with the hastening of death.

Each individual was of unique worth

The third theme was perhaps the most important because it emphasised the impossibility of reducing the care of the dying to a routine or a technique. Each person would have his own death to die, as part of that unique slice of history which was his life. Thus great care had to be taken never to overlook the *differentness* of others. The similarity of people allowed one to understand them, but that similarity was never sameness. If type-casting people and imposing preconceptions on them was avoided, then there would be something to learn from them as well as to give them.

'Preparing the way', then, was a new activity for each individual death. Literature on the subject could be of some help, but in the last analysis one could help the dying person by forging a personal relationship which acknowledged him as a person to whom one responded with respect and affection. Such personal encounter, set in a context of expert professional care, was the best thing that could be offered to any dying person.

MISS DOROTHY BOARDMAN, Social Work Adviser, Social Work Services Group, Edinburgh, discussed the social worker's role in helping the family and patient and, in particular, supporting relatives caring for patients at home.

Social workers were usually concerned more with relatives than with the dying patient and they became involved in various ways. Perhaps the most unfortunate, though not the most uncommon, was to be asked at short notice and without any prior knowledge of the patient or his family background to arrange his early discharge from hospital because he was occupying an acute bed; or perhaps the social worker might have known the patient in connection with some other problem before the diagnosis was made and might continue to work with him on the basis of the relationship already established, but in the light of the new medical knowledge. She might also be asked to see relatives just after they had been given the hard facts, or again the family might themselves raise problems with which a social worker's help seemed appropriate after they had started to come to terms with the implications of the diagnosis.

However the social worker came into the picture, there were often practical problems with which she could help. It would be a poor social worker who particularly in the field of terminal care concentrated solely on practical issues, but it was well known that for some people a factual problem could be a way into a deeper discussion of their feelings. Besides at times of stress it was difficult to think clearly about claiming various rights or applying for services even if they were known and even if by doing so they could ease just a few aspects of the problem.

Sometimes however a social worker had to go straight into the situation at a "feeling" level when a relative was advised to see her after being given the diagnosis. Often relatives did not see the point of coming at all and this might indicate that they did not understand the social worker's role and might mean "I don't see what anybody can do". Seen in this way it could be a poignant expression of how hopeless it all seemed. If the need to mourn were recognised in a physical sense, perhaps more thought should be given to the provision of rooms in hospitals for relatives. Perhaps too it was necessary to steer clear of preconceived ideas as to how patients or their relatives were expected to behave in terminal illness. Rightly no doubt the greatest concern was for the patient for whose care one was responsible, but understanding the relatives, particularly difficult ones, and supporting them was also a way of caring for the patient if through that support they could react more positively to the dying.

There was doubt also as to whether there was sufficient awareness of the need of some to express frustration and even hostility about the fact that there was no cure, and if sufficient care was taken to create opportunities for this where it might help. Developments in medicine had changed the pattern of causes of death and so many childhood illnesses which used to be fatal had virtually disappeared. In turn it was possible that public expectations had increased, and resentment that despite advances in medicine nothing could be done for "my" child. It would be difficult to express these feelings to a doctor or to a nurse but a social worker, who was not directly involved in treatment, might be regarded as a fair target for such comments.

There were few hospitals where social workers were expected automatically to break their contact with patients or relatives as soon as they ceased to attend hospital. Obviously one should not maintain a relationship without good reason, and in many instances it might be more appropriate to refer a patient with a long term incurable illness to a community based social

worker. Where a patient had died, however, and where a social worker was closely involved with relatives at the time, it would seem totally wrong to desert them while they still needed help in adjusting to loss and in planning a new future. However basically skilled, another social worker, who did not have first hand knowledge of their relationship with the person who had died, must be less effective.

The strange thing about death perhaps was that it was something which was experienced by all, and yet no-one's personal experience could benefit anyone else. And even if one had the personal experience of losing a close and dear relative, was anyone really in a position to say to someone else facing up to this "I know how you feel"? Perhaps inevitably one felt helpless because the natural course of events could not be altered but, contrary to taking the "nothing we can do" attitude, there was a great deal that could be done by helping people to face the inevitable, by letting them talk about their feelings without rushing to reassure, or appearing judgemental, by helping them to feel less guilty by accepting their feelings, and by ensuring they had all the practical help they needed. And in the end, even if their experience could not be shared, they could at least be given the benefit of one's concern, sensitivity and imagination.

DR W W YELLOWLEES, General Practitioner, Aberfeldy, spoke in relation to the care of dying patients in a Scottish rural practice.

He noted that his practice in the Perthshire Highlands totalled almost 3,400 persons; nearly 20% of the practice population was over 65 years of age and of these about 500 were over 70 and 170 over 80 years of age. Of the last 100 deaths registered at Aberfeldy, the centre of the practice area, 42 died in the cottage hospital, 31 at home, 22 at other hospitals and 5 died suddenly. Thus 73% of terminal illnesses were under the care of the patient's own GP. The percentage of non-institutional deaths in Scotland for 1971 was 39% and in Aberfeldy the average was 31%. This marginally lower figure, which might indicate that Perthshire relatives were less able to cope at home than the population as a whole was partly due, Dr Yellowlees concluded, to the facility of a cottage hospital in the middle of the practice which served almost as an extension of the patient's home. Beds were available and the same GP was in charge both at home and in hospital so that admission was much smoother and easier than in the cities where care was divided. Alternatively it could be suggested that the larger number of deaths was partly attributable to the shortage of home helps in rural areas. Depopulation had left few young families in the vicinity (between 1951-1972 the number of full-time agricultural workers dropped from 9,300 to 2,800 in the Highland area) and the summer bed and breakfast industry tied up a number of available helping hands which alternatively would be available in the home. In the hospitals too there was a shortage of trained nurses and although this was a nation-wide shortage it was worse in the rural hinterland. This shortage was very serious and it would be most unfortunate if for want of nurses the small cottage hospitals were to close. Two of the supreme tasks of a country doctor were easing people into this world and easing them out and cottage hospitals had a vital part in both processes.

Another great obstacle to dignified terminal care was the poor standard of council housing. Family houses, particularly in areas with a heavy load of old people, should make provision for members of the third older generation who were no longer able to live alone and who might be in terminal illness. Such provision might only require an extra room and toilet on the ground floor.

Although there was a shortage of home helps and nurses in the rural community, patients in terminal illness could be promised continuity of general practitioner care which seemed to be disappearing in the towns. In country districts partnerships were usually small, thus doctors got to know all patients and the late night visit could always be arranged. The large partnership of eight or so who ran rota systems and often used an emergency call system were, it was suggested, contracting out of an important part of traditional general practice and, particularly in terminal illness, small partnerships could offer better skills and services.

In conclusion Dr Yellowlees noted that doctor and nurses were part of a team, a team which would be far more effective in preparing the way if it could call on helpers not necessarily trained in nursing. What was required were more home helps, more trained nurses to keep the smaller hospitals open, better designed council houses taking account of social needs, smaller partnerships and possibly an extension of the cottage hospital notion to the towns by opening GP units in district hospitals.

MISS ISABEL CAMPBELL, District Nurse Tutor, Aberdeen, related her personal experiences as a community nurse and explained how she included the subject in her teaching work.

When considering the inclusion of care of the patient in terminal illness in the preparation and education of the district nurse, three primary factors were relevant:- (1) that a network of support had to be placed around each family; (2) that the district nurse had a part in this support; and (3) that support must relate to the needs of each family in a variety of circumstances.

It was essential that the family were prepared for looking after the terminal patient. Care was often thrust upon the family. An exploratory operation, a diagnostic investigation and an urgent need for hospital beds could result in a member of the family being told "little can be done, the patient is being allowed home to die". The impact of such information was so tremendous that the relatives needed time to adjust. Close communication between hospital and home was much needed and effective district nurse liaison with the ward sister was seen to ensure that patients were discharged when relatives had been prepared to assume care of them. A relationship with a skilled nurse before the patient came home provided comfort since she had expertise and would help with any nursing problems. In this way the nursing environment could be made ready for the patient. For instance the discarding of a double bed because the patient was much more effectively cared for in a single one could mean one aspect of a marriage relationship was ended for ever and the nurse must be aware of this and give much thought to the preparation and how she introduced the change.

The family also required instruction. They were so willing to assume this new job but so afraid of it. The nurse could bring order where there was confusion and some of her manual skills were transmitted to the family so that comfort was brought to the patient. She taught them how to care and they became increasingly confident and family equilibrium was regained.

Terminal illness was not a static state but a progression downwards. Each stage required new decisions and a nurse must be the leader in this situation. The introduction of each new piece of equipment and of each new service at the optimum time indicated another stage. For example, the patient who was encouraged to be ambulant should only have a commode when he was no longer able to walk to the bathroom; a ripple bed indicated to both patient and

family that further deterioration had taken place; the introduction of a night nurse to relieve family stress brought realisation of the inevitableness of death. It was necessary therefore that the nurse should introduce equipment and services with care and preparation. The family would need to be prepared for death when it came and what they required to have ready. The event so often took place in the night when relatives were alone with the patient and they would want to know whether they should notify the family doctor or wait till morning, or whether the undertaker could be contacted at any time.

It was also necessary to give the family support. The district nurse initially visited to give practical nursing care to the patient but one could not deal with aspects of a person's function and she was inevitably caught up in the network of interpersonal relationships, the dependency and independency and the reciprocal approval needs of groups of people. The satisfaction of needs in an intact family took place silently and automatically and like physical nutrition when all went well the importance of the various factors was not noticed. The impact therefore on this intact family of having to adapt to one member in terminal illness was tremendous. There could be partial denial of the situation, periods of grieving and periods of exhausted resting and all the time the care of the patient was an added burden.

The nurse was usually the member of the caring team with whom there was longest contact. She gave intimate care to the dying relative and a peculiar relationship with the family emerged. She was asked questions by both relatives and patient when they needed answers and she had to provide these thoughtfully and truthfully. There must be no hurrying in this situation; in the organisation of the nurse's day, time must be allocated to this home visit. The relationship built up would often continue after the death of the patient. Many studies had indicated that grieving was a defined process and the characteristic manifestations of a health reaction were lack of interest in present affairs and a preoccupation with the image of the deceased and memories of joint experiences. People had to suffer to attain the mastery of grief. The nurse because of her own relationship with the deceased could continue to give support in this new experience.

The nursing care of the patient in terminal illness at home was demanding and took place in an emotive setting. It was difficult to prepare the nurse beforehand for the effect this might have on her own emotions but she had to be supported through the experience and this must be one of the functions of the tutor. The complexity of needs of both patient and relatives in the experience of illness which ended with death called for the highest nursing skills.

Scottish Hospital Centre
June 1973

Health centres and the medical supplementary professions

Meeting at the Scottish Hospital Centre on 8 September 1973

At this conference, arranged in conjunction with the Royal Society of Health, the development of the Health Centre programme in Scotland was outlined with special reference to the expanding role of the professions supplementary to medicine in the provision of primary health care treatment.

DR I M MACGREGOR, Principal Medical Officer, Scottish Home and Health Department took the Chair.

DR H MILLER, Medical Officer, Scottish Home and Health Department in opening the conference noted that the health centre was merely the physical environment in which primary health care was delivered. The need for change in the deployment of medical and related services at this level stemmed from the progressive isolation of the general practitioner and a lack of investment in primary medical care during a period when technological development and investment was rapidly gaining pace in the hospital service. The single unsupported GP, with his limited technical resources provided at his own expense, was becoming increasingly dependent on a rapidly expanding specialist system of which he had become divorced and to which he had to refer his patients if they were to benefit from modern medical capability. His isolation from nursing help, from the support of the professions supplementary to medicine and others made his work progressively less rewarding, effective and satisfying to himself or his patients. His isolation from his medical colleagues in this kind of practice made it more difficult for him to exchange views and to sharpen his clinical acumen. Equally the hospital specialist was becoming progressively divorced from community practice as were many of the disciplines.

Health centre development had to take account of the changing character of the GP, family doctor or primary care service. The buildings must be capable of providing a good functional environment for the kind of service which was likely to emerge in the future - or they must be capable of extension or alteration to meet requirements which could not be accommodated during the early phases of construction. The Joint Working Party Report on General Practitioners in the Hospital Service* concluded that the service of the future should be:

1. a comprehensive and integrated clinical system supporting a broad spectrum of preventive, diagnostic, therapeutic and rehabilitative activity in collaboration with other agencies which contribute to health care
2. readily accessible to the community and able to provide continuity of health care
3. based on health centres which could, with advantage, be functionally and even physically related to a hospital and which were large enough to attract the maximum professional and technical support.

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* SCOTTISH HOME AND HEALTH DEPARTMENT. General practitioners in the hospital service: joint working party on integration of medical work, report of a sub-group ... /chairman: Prof. J. Crooks/ Edinburgh, HMSO, 1973.

4 staffed by family doctors who, in addition to having personal responsibility for the continuing care of their patients, would have access to hospital facilities in their own right and the opportunity to take part in the work of hospital-based specialist departments.

5 supported by hospital specialists some of whom would spend part of their time in health centres co-operating with colleagues in the primary care service; by community medicine specialists; by teams of nurses working in health centres and in domiciliary practice; by a range of supporting staff including secretaries, physiotherapists, occupational therapists and others and by social workers.

6 made up of teams of doctors and others which were significantly larger than accustomed and so organised that the members of the team would have opportunities to maintain a high level of clinical competence by post-graduate study and to provide sufficient time for relaxation and leave.

7 able to create an environment in which the personal doctor could utilise the advantages of the team approach in the service of his patient. The goal of technical competence should not conflict with the personal identification of the doctor with his patient which was one of the outstanding characteristics of general practice in this country.

Considerable importance was attached to the team concept and to the multi-disciplinary nature of the team. The professions supplementary to medicine formed an important cadre of professionals which went to make up this team, although not all of them would be likely to practice within the health centre.

The recent wave of recognition for the professions engaged in rehabilitation (Tunbridge* & Mair** Reports) had opened up new opportunities for the physiotherapist, occupational therapist, remedial gymnast and chiropodist to participate as members of the rehabilitation service. The rapidly developing specialty of dietetics was also one which was expected to make a considerable contribution not only in the treatment of dietetic aberrations but in their prevention. It was the policy in Scotland to support the primary care team with simple radiodiagnostic services, except in the smallest centres which had suitable alternative facilities conveniently situated. While the level of laboratory practice in health centres was not likely to be of sufficient sophistication to warrant the attendance of laboratory technicians, it was envisaged that an important link would develop between the hospital-based laboratory and the primary medical care system. The health centre however was regarded as a place where the usual side room work would be carried out and other specimens sent to a district laboratory.

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* DEPARTMENT OF HEALTH AND SOCIAL SECURITY and WELSH OFFICE. Central Health Services Council. Rehabilitation: report of a sub-committee of the standing medical advisory committee, / chairman: Sir Ronald Tunbridge/ London, HMSO, 1972.

** SCOTTISH HOME AND HEALTH DEPARTMENT. Scottish Health Services Council. Medical rehabilitation: the pattern for the future: report of a sub-committee of the standing medical advisory committee, / chairman: Prof. Alex Mair/ Edinburgh, HMSO, 1972.

The planning of health centres was a long and complex affair. In Scotland the Central Department was the only organisation which had overall responsibility for all medical services - and it was in this capacity that it had assumed executive control of the major part of the programme. Local health authorities had built nearly as many health centres as the Department under delegated loan sanction powers but they were much smaller and less comprehensive. The planning process involved obtaining the consent of all the statutory bodies and the individual GPs for the functional brief through the schedules of accommodation, sketch plans and so on.

Health centre design had been given considerable attention and guidance was about to be published on the subject. This would take the form of a comprehensive document including architects' drawings of every aspect of design although inevitably some parts of the guidance would be firmer than others. Broadly speaking the Departments' policy was to build health centres which were sufficiently large to justify the development of comprehensive services - provided always that they were sufficiently convenient to public access. To achieve good functional relationships and to avoid creating an institutional environment great care had been taken to break up the traffic flow into packages which were small enough to enable an intimate and uncrowded atmosphere. Special attention had been paid to privacy and patient dignity although these problems had been by no means resolved. To enable the economic use of the support services every effort had also been made to site health centres in the grounds of new or existing hospitals with which these services could be shared.

To date 48 health centres had been commissioned in Scotland and about 150 more were at various stages of development. While the earlier centres tended to be small and served small populations, larger buildings were beginning to emerge - including Woodside, East Kilbride, Dumbarton and Clydebank serving from 40,000 to 65,000 people. To these would be added a further 2 large centres in Glasgow during the next year and a number of others were in the pipeline. By the mid 1980s it was anticipated that some 80% of the Scottish population would obtain their services from health centres.

DR D M McLELLAN, Medical Officer, spoke as a member of a multi-disciplinary team based at the Scottish Hospital Centre which was currently carrying out a design-in-use study of health centres in Scotland. 11 health centres had been selected for detailed study ranging from large centres serving populations of 40,000 to 63,000 to smaller units with populations of 10,000. These health centres provided general medical services for a total population of approximately 276,000. The population receiving local authority medical services from the centres was approximately 229,000. The majority of GPs working in the health centres had health visitors, district nurses, midwives or combined duty nurses attached to the practice or working with them on an area basis. In many instances the GPs working in the health centres held part-time appointments in hospitals.

During visits to the centres by the study team, which covered the whole of the normal working day and on occasions longer, detailed information was collected from staff about the activities undertaken, comments being obtained about the accommodation and equipment available and observations made by the team about the individual factors affecting the health centre.

Chiropody was usually provided by the local authority. In the larger health centres this was undertaken on a full-time basis, but in the medium sized centres the number of sessions a week varied from 1 to 4. In one of the small health centres it was provided on a sessional basis by a private practitioner who worked outside the health service and in another at the local hospital. No service was available at one centre. The service was mainly for old people but in the larger centres special clinics were run for school children. A question which arose was the possibility of a chiropodist who visited intermittently sharing accommodation with other staff rather than having accommodation allocated exclusively but which was unoccupied for a large part of the working week.

Dietetics were usually provided by a weekly session by a hospital dietitian based at the local district general hospital. They were mainly concerned with obesity and weight reduction and problems of diabetic patients. There seemed to be scope for closer liaison between dietitians and health education workers and those involved with ante-natal and child welfare clinics. Contact with the dietitian was appreciated by health centre staff.

Medical laboratory technicians were not employed in any of the health centres visited. Although side rooms were provided in all the health centres some with elaborate equipment, there was strong evidence that these rooms were not being used for the purpose for which they had been designed but rather for the storage of medical and non-medical equipment. Exceptions were the test rooms closely associated with ante-natal clinics which appeared to be used fairly intensively by nursing staff for tablet testing. All health centres had open access to the area laboratory service and extensive use of this was made by all centres. Already there were proposals for 'on line' facilities at peripheral hospitals to print out results of investigations carried out at central laboratories and it was for consideration whether similar facilities for the larger health centres should be provided in the near future.

Occupational therapists were not present in the health centres nor was any special accommodation provided for this type of work. There seemed to be no reason however why a limited amount of 'active' occupational therapy work in association with physiotherapists could not be carried out in the larger health centres with well equipped physiotherapy departments.

Orthoptists, working on the basis of 1 or 2 sessions per week, were seen in 2 health centres. They were employed by the local authority as part of the school health service. Otherwise patients had to be referred to the nearest special unit providing this service.

Physiotherapy was available in 7 of the health centres visited but the remainder had direct access, although in one instance only for one day a week, to physiotherapy departments in local hospitals. At 3 centres the physiotherapists were employed by the local authority, at one by SHHD and the remainder by the hospital service. At 3 centres there was involvement of specialists in rehabilitation. In this connection there seemed to be distinct advantages in the local service being part of an area service and having the services of a specialist in rehabilitation available at a health centre. A domiciliary physiotherapy service at the present time and in the foreseeable future seemed impracticable because of staffing difficulties but a contribution could be made by the district nurse or a health visitor by providing information to the

therapist and even by supervising simple exercises at home. There was also scope for domiciliary assessment visits with or without an occupational therapist to determine the most appropriate treatment for an individual patient.

Radiological equipment was available in 6 health centres, 2 being not fully equipped, one providing 2 sessions per week, 1 x 4 sessions per week and 1 x 6 sessions per week. The health centre attached to a local hospital had a full-time service from the hospital. Within the health centres themselves examinations were confined to simple skeletal and chest radiography and where dental units were provided dental radiography was performed. The remainder of the health centres had open access to local hospitals. Where a radiologist visited or a GP had received specialist training in radiology there were definite advantages to the staff of the health centre. Less satisfactory was the arrangement of referring films to a radiologist who did not visit the centre.

As with the remedial therapists there was the difficulty in reconciling patient convenience and availability of staff with the need to make maximum use of staff and equipment. From the point of view of maintaining professional contacts there seemed to be definite advantages in being part of an area service rather than working in partial isolation. There was no doubt that radiological facilities in the health centre were an advantage to staff and patients. The critical question related to the size of population which could justify a radiology and physiotherapy department in a health centre and although it was difficult to be precise about this, the minimum population would appear to be at least 20,000.

Remedial gymnasts were not present in the health centres visited but there seemed to be no reason why they should not work there.

Speech therapy and audiometry were provided by local authorities on a sessional basis and were seen in 3 centres. Apart from some moveable equipment no special provision had been made but a useful service was being provided.

Social work was being actively practised from 2 centres but facilities for the interview of clients were available in several of the others. Where there was an active social work presence a great advantage to the staff and the population was given but there was very definitely scope for further development of this field of activity in health centres.

In conclusion Dr McLellan noted that fast moving developments in community health services, particularly in the field of primary medical care, in the building of new health centres on a large scale and the reorganisation of the health services next year would present the professions supplementary to medicine with new opportunities and challenges. To meet these there was need to maintain a flexibility of outlook and to be prepared to change working methods to provide the best possible service for the patient.

Contributions were then presented by a physiotherapist, radiographer and a chiropodist on the organisation and management of services in their particular health centres.

MISS H S R ANDERSON, Physiotherapist, spoke on the services provided at Craigshill Health Centre, Livingston. This unit was designed to serve a population of some 10,000 persons on the lists of 6 general practitioners who worked part-time as GPs and part-time as medical assistants in different specialties at the local district hospital. There were also 3 full-time dentists providing general dental services; local authority clinics; hospital consultant sessions and the physiotherapy department in which she worked single handed for 6 half-day sessions per week.

As with other new towns with good quality housing and new industries, the bulk of the population was made up of young people with families and consequently most of the work was with children, young mothers and husbands who might be recovering from accidents at work. The patients, about 500 a year, were referred either by hospital consultants, about 40%, or direct by the GPs working in the centre and also those soon to be working in the new Howden Health Centre about ¾ mile away. The population currently served was therefore nearer 17,000. This method of GP referral was certainly good for the doctor and it was convenient for the patient who did not have to be routed through an out-patient department but it did not make for entirely satisfactory working for the physiotherapist. On many occasions it would be more satisfactory for patients to be referred first to a specialist used to ordering physiotherapy and who could determine the treatment required and the length of time it should be given. On completion of a course of treatment the specialist could then determine its success or otherwise by referring the patient back to his general practitioner.

Extracts from the Tunbridge and Mair Reports on rehabilitation were relevant. Tunbridge stated that "The argument in favour of direct referral of a patient by his GP to a physiotherapist cuts out delays caused by the wait, often of several weeks, to see the consultant in rehabilitation, but the argument against this is that regrettably at the present time many general practitioners are out of touch with the modern concepts of remedial treatment and departments might become overburdened with patients for whom unnecessary or inadequate treatment has been prescribed". The Mair Report was more specific suggesting that the GP could enlist the aid of a consultant in rehabilitation for patients presenting complex problems.

There were many advantages, however, in working in a health centre. For instance when the consultant paediatrician held his out-patient sessions at the centre, the physiotherapist had direct contact with him and was present in the consulting room when he determined the treatment required. If a patient required a new dressing he could readily be sent to the treatment room where an experienced nurse would apply the dressing. In the event of a patient collapsing during treatment there was invariably a GP on the premises who could be called on to resuscitate the patient.

If required the physiotherapist had access to the GPs' patient records and one of the most useful contacts was with health visitors. This was often not available to members of the profession working in large departments in hospitals. Health visitors and district nurses could bring to the attention of the GP to whom they were attached those patients they thought required rehabilitation. Another major advantage in working in health centres was that it was a multi-disciplinary team effort that was brought to bear on patients requiring care and this was probably best achieved in a centre the size of Craigshill. In the larger centres it was doubtful if the same close relationships could be achieved and therefore, the patient, while not getting any less care, would not have it

provided in a fully co-ordinated way. This applied particularly to young children who soon got to know the physiotherapist - not wearing a white coat - and therefore had no fears or worries about attending a distant and perhaps large hospital department. At Craigshill a weekly clinic for young children was held and mothers knew that, if for some good reason they could not attend that clinic, they could visit at another time when their children would get the necessary care and attention. Ante-natal relaxation exercises were also held in the physiotherapy department. Another advantage for children at Craigshill was that due to the proximity of the local school the swimming pool could be used for weekly hydrotherapy classes. This was a useful facility which was not one to which there was normally ready access.

There were 2 major disadvantages to the provision of physiotherapy services at the centre. The first was that there was no direct access to the appliance department of a hospital when a simple orthopaedic appliance or repair was required. A lengthy process of referring the patient to his doctor with a recommendation that a certain appliance should be provided had to be gone through. The GP had to refer the patient to a hospital out-patient department and eventually the patient was seen, the recommendation was approved and the patient might have to make another separate visit to the hospital department to be measured for the appliance. Secondly there were disadvantages in being a single-handed physiotherapist and not having regular frequent contact with colleagues in the profession. There was no easy solution to this problem and regular meetings of multi-disciplinary groups on a national basis were of considerable benefit in enabling an interchange of views to be made amongst the professions involved.

MRS J LUSK, Radiographer, described the role of the X-ray department at Springwell House Health Centre in Edinburgh. The provision of an X-ray department in the centre, which was adapted from an existing building originally used as a civil defence headquarters, had been by nature of an experiment and the working of the unit had been the subject of a survey by the Scottish Home and Health Department over a period of some 12 months.

There were 10 general practitioners in the centre working in 3 practices, each with 2 in partnership and 4 on a single-handed basis. There was no integration between the practices, each patient having their own doctor or partner and the consulting hours varied although all had morning clinics between 9 - 11 am. In all 20,000 patients were served by the centre.

Each doctor had his own secretary and for 6 doctors patients reported to the main reception areas before entering the waiting areas which served the consulting rooms. The X-ray department was open from 9 am until noon during the week and patients came both from the morning surgeries or by appointment from a previous visit. Any patients seen in the afternoon or evenings were booked by the receptionists either for the next day or next available appointment.

The radiographer worked single-handed undertaking all X-raying, developing, washing and drying of films together with the clerical work. The usual arrangement was to book 6 patients per morning, giving appointments at 15 minute intervals and to fit in emergencies when necessary. Between 11 am and 12 noon was left free to file return films and their cards and to have the day's films cut and dried in their bags ready for reporting.

The X-ray room was relatively small (15' x 23') but quite adequate for the demands of the clinic. The X-ray tube had no overhead cables and the machine was plugged straight into the mains voltage. The console was designed as a prototype with simplicity as its main factor. The console was very compact and simple to operate and designed so that 2 GPs in the centre, who had undertaken 6 months training in this specialty, could operate the unit in the absence of the radiographer. However over the last 3 years this had been infrequent. There was no locum for the radiographer and anything which could wait was kept until her return. In relation to type of work there was no contrast media undertaken but all other examinations were performed.

A chart had been prepared for the console to aid exposure number selection and was based on the slide rule principle; this again was designed for use by operators other than the radiographer. Other accommodation included a small office for clerical work and a single changing cubicle which could on occasion delay the flow of patients since it was impossible to hurry elderly patients when changing. The dark room was adjacent to the main X-ray room and included the developer, tank spray rinse, fixer tank and wash tank for wet developing. An automatic unit was not felt to be necessary although should the numbers increase time could be saved by providing one. The dryer used was small and held 12 films at one time so that on a busy day when the numbers were increased to 9 patients it was quite a task to get them all cleared up by the end of the session. To help with the situation therefore the number of skeletal surveys undertaken in one particular morning was usually restricted. Each doctor could view his patients' X-rays at the time and any fracture located could go to hospital along with the films.

The 2 GPs trained to interpret films reported on them each afternoon, one copy of the report being retained in the bag and the other going to the patient's own GP. Films were then taken to the Royal Infirmary of Edinburgh where they were reported on by the Head of the Radiodiagnostic Department. It was intended that the double reporting process would continue despite the fact that the centre's GPs' reports were in practice very accurate.

In conclusion Mrs Lusk underlined the co-operative spirit between the professions at the Springwell House Centre and the advantages that accrued from links with the Royal Infirmary in relation to the reporting on films and the supply of X-ray materials and stationery. The patients enjoyed considerable benefits from the arrangements and were always the first to express their appreciation of the services provided within the one building.

MRS L M HAMILTON, Chief Chiropodist, Health Department, Corporation of Edinburgh, described her part in the chiropody services provided at Springwell House Health Centre, Edinburgh. She noted that in industry it was said that the most important assets were people and in the health service it was no different - people were important - both those employed by the service and those served.

The co-operation between doctors, health visitors and chiropodists was greatly enhanced by the closer contact and collaboration enjoyed in a health centre. For example many elderly people had never been to a chiropodist before and in Springwell House the doctors usually brought their patients along and introduced them to the chiropody section, and this overcame any existing nervousness. The doctors also discussed with

the chiropodist any health problems which might exist and for themselves could also see how the service functioned and thereby appreciate the problems and pressures on the unit.

At Springwell House over 100 patients were treated in the chiropody department each day and in the event of a patient needing urgent treatment this could usually be coped with as an emergency. It was also usually possible to give a new patient an appointment within 2 weeks. This was not so easy in smaller clinics where there were fewer cancellations and consequently the waiting time for a new patient to get an appointment could be up to 6 weeks. The other part of the team who deserved a mention were the small but important number of clerkesses who supported the service - without their help the chiropodists could not have achieved 58,000 treatments per year, 12,000 of which were domiciliary visits. In the first 3 months of the current year 3,000 more treatments had been given compared with the same period of the previous year.

If any of the domiciliary chiropodists called on a patient whom they felt required the services of a health visitor this information was passed to the appropriate department who would then take action - this also applied to social workers. This could work in reverse thus proving the advantages of team work.

Mrs Hamilton considered that there could be disadvantages if the centre were too large and a consequent loss in the personal touch which was so important. A maximum of 12 doctors for each centre might be just about the right number. Again there could be problems when, like Springwell House, premises were converted for use for another purpose. These could apply to such things as the provision of steps which had to be negotiated by elderly patients and again in relation to lack of space and inability to expand. Undoubtedly purpose-designed premises were the answer and particularly important in this respect were the provision of large doors, preferably of a swing variety for easy access, windows, enabling plenty of natural light to infiltrate, adequate room in the surgery, good ventilation, attractive landscaping and a design enabling the building to be expanded if this were found to be necessary in the future.

DISCUSSION

In the course of 2 discussion sessions various points brought out in the main papers were discussed by members of the audience which was widely representative of the professions supplementary to medicine. It was stressed that many of the services provided by this group were in a rapidly growing area and that under integration of the National Health Service and the consequent expansion in primary health care facilities, an increase in demand for these services would take place. Because of this growth in level of service, sharing of accommodation and equipment by the various professions, at any rate in the long term, was thought likely to pose more problems than answers. Difficulties could arise in relation to cross infection for instance by sharing accommodation between dentistry and chiropody and it was also suggested that staff morale was reduced by doubling up in this way. It was felt that the planning of new health centres should continue to be on the basis that an optimum service would be provided in the units in all the disciplines considered necessary at the planning stage. One difficulty in this connection was that the functional planning of a new unit could take place anything up to 6 years before commissioning and it was not unknown for views to change during this period or for certain services to be not provided for

financial or other reasons. There was room for flexibility in approach, however, in certain situations and it was possible that intelligent programming of activities could lend itself to more fuller use being made of some accommodation.

In terms of the design of health centres the need for full consultation at the planning stages with potential users of all professions was stressed. It was noted that as far as practicable expert opinion was sought during planning, although with the time factors involved it might not be possible to foresee every up-to-date development. The interpretation of architect's drawings could also on occasion lead to misunderstanding by non-technically minded staff. It was noted that the Scottish Home and Health Department were soon to publish design guidance on the building of health centres and, although it would incorporate recommendations for room areas and functional relationships, it was expected that news sheets and supplementary information would need to be issued from time to time to take into account new developments in ranges and types of services proposed for health centres.

In relation to particular areas of buildings, the need for the day time care of the elderly was urged as too was the need to provide adequate accommodation for physiotherapy in relation to the types of treatment to be provided rather than to the number of patients to be treated. The value of a staff common room, where inter-disciplinary discussion between the various professions could take place was also underlined.

Finally the importance of instruction in the value of rehabilitative procedures was most important and emphasis was laid on the need for medical students and general practitioners to be made fully aware of their effectiveness during undergraduate and post-graduate training courses.

Scottish Hospital Centre
September 1973

Hospital finishes and maintenance

Meeting at the Scottish Hospital Centre on Friday, 2 November 1973

Although the problems associated with hospital building maintenance had for many years been given low priority against other competing sectors of the NHS, an increasing general awareness of the subject has been developed since the publication of the Woodbine Parish Report. At this conference a multi-professional group of speakers outlined considerations in relation to maintenance which should be taken into account both at the design stage and in the day-to-day running of hospitals.

MR R G CLARK took the Chair

MR T R SCOTT, Architect, Keppie Henderson & Partners, Glasgow, in opening the conference noted that the problem of maintenance had existed as long as there had been buildings to maintain but only in recent years and because of rising costs had any serious thought been given to reducing the incidence of the problem. It was now considered that more care should be taken at the design stage to produce buildings with lower annual maintenance charges since many of the new hospitals seemed to cause more trouble than did traditionally constructed buildings. This situation had come about because every aspect of the building process had undergone radical change in recent years. One reason for this was the greater demand for improved standards of comfort and utility of buildings which in time had led to an increase in the scale and complexity of projects and a radically altered role for the architect. To obtain higher standards at economical costs it had been necessary to introduce non-traditional forms of construction. No longer was it possible for one person to design every aspect of a new project and the problem of design for the architect was now largely one of close co-ordination of the many skills required to produce a building which would satisfy the users' requirements in every way and within the ever-present restraint of cost.

The increasing complexity and difficulty of the building process with the introduction of a very wide range of new materials and new methods of construction had created a situation in which there was a greater possibility of failure in construction or in materials and finishes than before. A great deal of useful information about damage in hospitals and how this could be avoided was available and it was essential to make sure that this and other such information was referred to at the planning and design stage when knowledgeable decisions on finishes and materials and their subsequent maintenance were taken.

Apart from normal maintenance, cleaning, painting, etc. there was the question of repair and renewal of defective construction. To understand why these defects occurred it was necessary to consider the various factors which caused buildings to deteriorate such as weather penetration, effects of the sun, internal climate, and mechanical damage.

Architects and other members of the design team should give special consideration in dealing with problems of maintenance to elements where subsequent maintenance might give rise to a high nuisance factor; elements where maintenance might be difficult because of access; and elements where past experience indicated that there was a high maintenance requirement and to ensure that the risk of constructional failure was least where the cost of repair was highest.

The continuing problem of maintenance and the maintenance of buildings depended to a large extent upon and was influenced by the architect and other members of the design team who had a total responsibility for the design. The contribution expected from contractors, sub-contractors, suppliers and manufacturers and the responsibilities that they also had could not however be ignored - workmanship and quality were vital factors. Traditionally the architect's role ended at the end of the maintenance period and responsibility for upkeep thereafter rested with the building supervisor and the hospital engineer. There might, however, be a case for avoiding this cut off point and ways and means found of overlapping so that the hospital staff could be brought in at a much earlier stage to become familiar with the project. This would not diminish the vital role of the client or the importance of briefing. Hospital briefs had improved in recent years and planning teams were now producing very detailed and comprehensive briefs which set out the operational policies to be adopted and the very detailed accommodation requirements for the building. Cost limits were established and procedures for developing a project from inception to completion fully worked out but there was usually little mention of maintenance. Clearly designers must be given adequate scope to exercise their skills and make use of their experience but some policy notes based on past experience or some guidance notes recording the Board's overall experience on the problem of maintenance would be useful.

Although no-one could deny the importance of the need for cost allowances or cost control it could be questioned whether these were too rigid and contributed to the maintenance problem. Architects were frequently requested to undertake a massive cost reduction exercise when the lowest tender received was well in excess of the final cost limit and it was well appreciated that savings at this stage in the design process might have to be drastic and even ill considered. The results of lengthy discussion about the suitability of materials and finishes could be overturned overnight and cheaper and less acceptable alternatives substituted. The basic structure - foundations, frame, cladding, roof - remained but the finishes suffered the most because it was easier and quicker to make late changes in these elements without becoming deeply involved in a major redesign exercise and the delays that would result. It was difficult to decide whether the cost limits were too rigid or too rigidly applied at tender stage or if the tendering system needed a radical overhaul, whether quantity surveyors could provide a more accurate cost planning service for a higher fee or if the architects aimed too high. There was no doubt however that cost limits had an effect on maintenance and these should be challenged when reasonable standards across the board could not be achieved and good building practice had to be sacrificed.

The life of a building also had some bearing on the problem of maintenance. The need for flexibility was always stressed but if components could be identified which would become obsolete within a reasonable period then a higher maintenance cost and lower capital cost might be justified for such elements. On balance a better relationship between initial or capital cost and maintenance costs among the various components or elements of a building would be desirable.

In conclusion Mr Scott suggested that serious consideration should be given to the following points which might contribute to an improvement in relation to designing for easier maintenance;

1 in the field of education, coupled with a degree of common training, an opportunity for greater understanding and team work amongst all those involved in the building process and certainly a greater appreciation of one another's problems

2 a better relationship between capital cost, running cost and maintenance cost so that they were not considered in isolation by different groups or departments

3 the interpretation of cost allowances on a more flexible basis than at present - to allow for market conditions, availability of labour, inflation, geographical location and competition from the private sector

4 more data available to assist designers to make the right decisions on materials and finishes at the appropriate stage in the design process and more design-in-use studies carried out with a fairly rapid feedback through some central organisation

5 more exchange of ideas with an emphasis on case studies and examining one hospital in depth or one particular aspect of several hospitals and drawing comparisons

6 more attention paid to the need for accurate, comprehensive and easily read record drawings for the building together with a manual which described the building, the thinking behind the design solution, a restatement of the operational policies, data about the materials and how they should be used and treated, cleaned and protected.

7 a greater appreciation by manufacturers of equipment of the need for good design and in addition full realisation of the need to design moveable equipment which would not cause serious damage to walls, doors, screens or floors

8 greater use of professional interior designers who might be better qualified to advise on surfacing materials because of their wider experience in all types of buildings and areas of buildings which were subject to heavy traffic and abuse

9 the re-organisation of the Health Service in Scotland and the new maintenance organisations to be set up would surely create the need for a high level of management still coupled with professional and technical competence.

MR C H HARRIS, Regional Engineer, North-Eastern Regional Hospital Board, spoke on designing for easier maintenance in engineering and planned preventive maintenance schemes. He noted that reliability of plant and its good service was dependent on good design, correct operation and adequate maintenance.

The initial design of an installation played a very important part in its ultimate operation since if the design did not meet the requirements of the user then it could never be regarded as satisfactory. The designer should be made aware of the needs of the user and this required that he was properly briefed in the first place. The designer should also be keenly aware of the problems associated with the operation of the plant he was designing and equally of the need to maintain that plant in satisfactory order. It followed that the best designer would be one who

had had possibly practical experience in the manufacturing process but certainly in maintaining engineering plant.

It was essential that adequate access should be provided to the plant and this could be difficult due to pressure of space in buildings and the pressure to work within the Building Note Cost Allowances. If sufficient space was not allocated to the engineering services then essential maintenance was often skimped or even completely neglected.

Another important factor in good design and equally in a high standard of maintenance was the selection of equipment and materials which were to recognised standards. The use of standards meant that spares could be easily obtained and could be held in small quantities, and also had the added advantages of low cost and quick delivery. It was important not only to recognise national and international standards but also those which were standard to the particular hospital which over the years had built up a collection of equipment of a particular type mostly because the group engineer and possibly a designer had found it to be best suited to the particular need. It was suggested therefore that it was well worthwhile any designer concerned with hospitals consulting with the group engineer on any preferences he might have, although this did not bind the designer to these preferences, but at least made him aware of any special problems that had been encountered in operating and maintaining the plant.

The trap of "cheapest is best" was another fault which all engineers concerned with building were guilty of under the pressure of cost limitation. In some instances cheapest could be best but in others unfortunately the cheapest product offered to comply with a weakly worded specification resulted in problems for the maintenance engineer and the client.

A factor which was often overlooked by designers in the interest of economy was the practice of designing with too small a margin of tolerance to cover the stress under which the plant would operate. It was important for designers to remember that the plant specified might well work on occasion at a much greater stress limit than was perhaps expected because of increasing demands upon the hospital service. This would only result in the plant suffering and ultimately requiring undue maintenance.

Safety was another factor which too often was not given the attention it deserved. This could result in equipment not being properly guarded to allow safe access, wiring being exposed, difficult and dangerous access and fire hazards. It was also important to provide good lighting and ventilation for the maintenance engineer and these were aspects which were often completely overlooked by the designer.

Although the engineering plant and equipment in hospitals were continuing to become more complex and more costly it was not necessarily becoming more troublesome. Nevertheless it would require attention in the form of lubrication, adjustment, replacement of worn parts and testing. If this was not followed then 'breakdown maintenance' had to be undertaken. This was however a wasteful method of operating engineering plant because there could be a risk in certain instances to the safety of the patient and the user of the equipment; there was often fire risk; the attainment of satisfactory standards of performance was made difficult to achieve; economy in operation suffered; and continuity of use was unlikely.

In view of this schemes of planned preventive maintenance for engineering plant had been devised by the Central Departments. Different schemes existed for England and Scotland, the essential difference being that for

the latter there was provision built in for an easy costing system. The Scottish system also included provision for the feedback of essential data to the maintenance manager and to the designer. Before the system of PPM was introduced in certain hospitals up to 50% of the total maintenance budget was being spent in dealing with breakdowns and ad hoc requests for repairs to engineering plant. Although this was wasteful in terms of maintenance staff time, some argued that PPM would cost more than it was worth. In other words breakdown maintenance was adequate and cheaper. On the other hand with PPM, plant was kept on line longer, nursing and medical staff and patients received a better service, the skills of staff were utilised to the full and as far as the plant itself was concerned, it extended its working life considerably and, if the system was properly operated, it would reveal when plant would be replaced. Fewer emergency situations would arise from breakdowns, it would provide an even spread of work over the year which allowed a much better utilisation of increasingly costly tradesmen and it enabled a better budgetary control to be achieved. In relation to this budgetary control DHSS were in process of devising a system to establish the relationship between maintenance expenditure and the standard of maintenance of engineering services and from this norms of recommended expenditure levels for all hospital engineering services. This had as its object the creation of more consistent and uniform standards of engineering maintenance throughout the Hospital Service.

The value of NHS hospital buildings had been assessed at £3,200m and of this engineering services counted for approximately £1,000m. It had been demonstrated that over the past decade the total building and engineering maintenance expenditure had remained essentially constant in real value terms. However there was evidence to show that the expenditure in engineering maintenance had increased slightly over the last five years and this was attributed to higher environmental standards such as lighting, heating, ventilation, air conditioning and increased usage of electro-medical equipment for treatment and diagnostic purposes. Another feature was the increase by 40 - 45% of engineering tradesmen offset by a 30% reduction in boiler attendants and a 10 - 15% reduction in building maintenance trades signifying an increase in engineering maintenance requirements. From these facts the increasing need for the engineering designer to make adequate provision for easy maintenance was apparent.

MR A H DINGWALL, Building Supervisor, Ninewells and Associated Hospitals, discussed his role in relation to the day-to-day problems of maintenance of buildings.

He suggested that building maintenance could be divided into four categories - 1 maintenance required by day to day weathering, decay and old age; 2 maintenance required due to wear and tear by day-to-day use and misuse by hospital personnel; 3 premature maintenance caused on recently built units by under or bad specification when the building was being erected, eg lack of control valves on hot and cold water services, lack of inspection and access points; and 4 maintenance caused by vandalism. All these required funds to make good the damaged sections back to a reasonable standard of finish.

The maintenance problem of external surfaces normally came under the head of weathering caused by the effect of the sun, rain, damp, frost and wind. This weathering hadmore effect on some component parts than others. For instance in relation to roofs, maintenance on the slated type was not extensive and was by comparison inexpensive over the years - however in

time the slates slipped and leaks resulted. Due to high cost however slated roofs were now very rarely specified and the less expensive interlocking types which also gave a satisfactory roof were usually specified. On occasion timber roof shingles were used and these normally gave satisfaction for many years without giving any maintenance problems. Flat roofs were particularly troublesome to building supervisors on account of water leakages and it was suggested that, if they were to be specified, they should be given a sufficient lift to cast all the rain water clear into the gutters.

Many of the older hospitals were built in stone and as they aged they required attention in the form of scaling down and re-pointing. It was sometimes difficult to get funds to carry out this type of work but it was strongly recommended since in addition to providing a much better appearance it added years to the building's life. Brick and roughcast was the more general type of wall finish and very few problems were experienced with this type of structure provided care was taken to ensure that all the wall ties were cleared of mortar droppings as this provided a bridge and capillary action ending up with damp marks on the inside walls. Other wall finishes included concrete cladding and this was particularly good against normal weathering.

Drains were another feature of hospital building which frequently gave rise to maintenance problems. It was essential that they should have the specified runs complete with rodding eyes, manholes etc so that they could be easily cleared. A large amount of money was spent annually clearing chokes often caused by paper towels and cloths and it was essential that domestic staff should be careful not to dispose of cloths by way of the sluice.

Internal maintenance problems within hospitals were many and varied. The most extensive and expensive item of internal maintenance was probably painting and washing down wards and departments. Difficulties could arise when there was not a buffer ward which necessitated redecorating half a unit at a time with the patients occupying the other half and this form of redecoration should, if at all possible, be avoided. Another problem that arose was in relation to floor covering where maintenance was greatly increased if domestic staff used large volumes of water to wash the floors.

The problem of dry and damp rot was ever present and constant observation had to be undertaken to locate any such trouble spots. Particularly important were the areas where the heating ducts joined the main building. The ends should be sealed off with bricks built in lime and the complete area coated over to prevent damp, humid air rising from the duct which would start damp rot on any wall strapping, ends of joists etc. Problems could also be encountered with bedpan disposal units and staff should all be advised of the importance of using the machines according to the instructions and allowing the full cycle to be run out.

In view of the high cost of maintenance Mr Dingwall suggested that the building supervisor should be brought into early discussions at the planning stage of new buildings so that he could raise any matters that were essential towards easier maintenance. Similarly with the choice of furniture he should also be asked for comments and given the opportunity of making suggestions with a view to reducing subsequent maintenance costs. Another problem related to the financial control of maintenance funds and in this respect it would be of great help if the building supervisor was advised of his allocation as early in the financial year as possible so

that a planned maintenance programme could be devised for implementation through the year. As quoted in the Hospital Technical Memorandum* on maintenance of buildings "An efficient building and engineering maintenance service cannot be provided by an engineer or building supervisor working in isolation. It requires the full support of the hospital authority and active co-operation of the heads of the different departments, and the hospital and group secretaries."

MISS HEATHER BIRKETT, Designer, Robert Matthew, Johnson-Marshall & Partners discussed the choice of materials for finishes and furnishings and their effect on maintenance costs. She indicated that it was possible with the necessary skill for a very good standard of interior to be achieved within the hospital building allowances. It was essential however that the interior designer should be brought in at the very beginning of the job since a hospital more than any other building was judged on its 'inside', how efficiently it worked, how easily and cheaply it could be maintained, how its environment created good working conditions and how it aided recovery. Only a small percentage of the whole complex of a hospital had to be clinical and, although the majority of other areas should appear clean and efficient, the textures could be much softer in nature. The main factors in achieving this 'friendlier' look were an avoidance of highly reflective surfaces, effective noise deadening and a sensitive choice of materials and colours producing a visual calm.

Illustrations by way of colour slides were shown indicating the importance of specifying the correct materials for particular situations. Carpets could be used to visually soften an area, deaden noise, eliminate glare and reduce maintenance costs although it was important to choose the right carpet for the right job. The use of carpet tiles, however, could be questioned. They had to be cut and stuck round awkward shapes, where wear was often the greatest, and had to be lifted and changed round regularly to avoid 'tracking'. In relation to PVC floors, sheets with welded seams were preferable to tiles which did not retain appearance for long due either to adhesive squeezing up between the tiles or dirt and polish becoming embedded in the joints. Also it was preferable to avoid glare by not buffing these floors to an unnecessary mirror finish.

More use of pinboards was desirable to save walls from being damaged by tape and drawing pins and this also helped to reduce maintenance costs. Also with the disappearance of oil based paints and the use of water based emulsions with varying degrees of plastic resin added, surfaces would become more hard wearing in contrast to those with shine which, apart from creating glare, also showed up plasterwork deficiencies. As an alternative wall covering wallpaper could be specified although it tended in time to tear and fade. Inherently flameproofed hessian which could be vacuumed, brushed and scrubbed and ultimately repainted could also be used for wall covering. It could with advantage be applied in circulation areas where notices might be pinned to walls and its sound deadening qualities would be appreciated. The policy of one major new hospital was described, where it was decided to underprotect walls, and put buffers on all mobile equipment. Some damage was still occurring but it was felt that only by the continuing education of staff either by training or by example could any improvement be expected.

Melamine doors which were expensive and showed greasy and dirty marks easily, were difficult to clean and could still be damaged irrepairably. In preference painted plywood faced doors should be provided since these

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* Maintenance of Buildings, Plant and Equipment - Hospital Technical Memorandum No 12. Ministry of Health (HMSO) June 1964.

were easier to clean, could be repainted and were cheaper to replace. In terms of maintenance it was also important that doors should be cleaned daily by domestic staff.

Signposting also had an important role as part of the interior and it was most important that architects should remember to include for this in the original cost plan. In relation to lighting it was relevant to note that not all areas required to be overlit, since many situations, with even basic wall and floor finishes, could look satisfactory if the effect of lighting was considered.

Vandalism could also be a significant problem in terms of maintenance and in public areas where it was most prevalent surfaces of rough aggregate finishes or paint should be provided which made writing or scribbling difficult. Sprayed slogans if they did appear could then usually be removed by a proprietary solvent. Suspended ceilings of all types were hazardous to clean but they could be even more so if access panels were not marked clearly.

Furniture should always be considered along with finishes as a part of the interior. There were many areas where cloths could be used for upholstery and, apart from appearing much softer than plastic and also feeling much more comfortable, it was less prone to tear and damage and could be easily repaired without losing its appearance. It was important to remember, however, that all covers should be removeable, the cloth should be inherently flameproof or 100% wool and a patterned design should be avoided to aid future replacement.

In relation to curtains the extent of completely sterile areas in hospitals where curtains must be boil washed was very small. Elsewhere inherently flameproof fabric could be used although this must be washed at a lower temperature and could not be ironed well. For other areas, such as student accommodation where curtains might be taken down only once a year, fabrics of interesting weave and composition were preferable and these should be dry cleaned. With new fabrics also, the laundries needed to adjust their traditional role if they were to take advantage of the benefits inherent in some man-made fibres and fabric treatments.

In conclusion Miss Birkett noted that with skill and determination a good standard of interior design for hospitals could be achieved. With better materials coming on the market the standard was improving all the time but there was a large responsibility on the part of the appropriate hospital staff to ensure that a satisfactory standard of maintenance and good use were achieved to provide the optimum environment for both patients and staff.

MRS M G SAUNDERS, Adviser on domestic and ancillary services, Scottish Home & Health Department, discussed the maintenance requirements in relation to the finishes provided in Health Service buildings. She noted that cleaning and maintenance on a day-to-day basis was not a glamorous branch of industry and rarely dramatic, but expenditure on these items was a significant factor in any hospital's budget. Cleanliness of an environment had an enormous psychological effect on both patients and staff - a clean ward encouraging neat work and a dirty ward causing friction and trouble.

In 1972/73 some £8m was spent on cleaning Scottish hospitals. In order to contain this cost at a reasonable level it was essential that domestic administrators were brought into discussions about the type of floor

coverings and wall surfaces which would be used in hospitals. With the right surfaces efficient maintenance could be achieved and this was of considerable importance in guarding against cross infection in the hospital situation.

Of all the surfaces in any type of building the floor provided the greatest number and variety of cleaning and maintenance problems. They were constantly exposed to heavy loads, impact, abrasion, spills and the action of dirt and moisture could account for up to 1/3 of the total cleaning time in a unit. Often too little attention was paid by the building professions to the cleaning qualities of flooring materials and the ease or difficulty of keeping a reasonable standard of cleanliness was usually only found out by bitter experience. White floors in particular were easily scuff marked by cheaper quality shoes. Vinyl or thermo-plastic tiles while having a very bright appearance when newly laid, imposed a strict maintenance problem on the domestics. These floors unless properly treated quickly lost their shine and became scratched. Unwelded floors were generally unsatisfactory for the cleaner, while for those which were welded it was advisable to apply a seal properly and then maintain as simply as possible. The initial clean of this type of flooring was exceptionally important although problems could exist due to faulty screed in the laying of this surface. As a floor covering, linoleum as well as vinyl should be sealed when it was laid and, if difficulty was found in sealing, the dressing applied by the makers could be stripped off beforehand. It could be maintained with the minimum of detergent and water with buffing as necessary and, even if it was not found possible to undertake daily maintenance, linoleum tended to maintain its appearance long after vinyl had deteriorated.

In relation to carpeting it was important to note that a cleaned carpet was only 50% free of bacteria compared to a clean linoleum or vinyl floor which might be 90% free. With this in mind designers should consider the type of patients to use a carpeted area and the type of wear a carpet might expect in a particular area. Man-made fibre carpets, especially pure nylon, were very easily stained and this could not usually be removed by scrubbing. For easy maintenance a carpet comprising 80% wool and 20% nylon was most acceptable and, although the cost might be greater, a smaller carpeted area of this type would always be more satisfactory than a larger expanse of stained nylon carpeting. It was also most important to have the correct equipment to clean carpets from the outset. Shampooing was an effective method of cleaning if the operators were properly trained and it was important to remember that where appropriate carpets should be given anti-static treatment. Certain long haired carpet tiles, with the correct cleaning techniques, were also proving quite satisfactory in a number of hospitals.

On furniture, some chairs, functional or easy were more difficult to clean than others and, although the tweed-like finishes on chairs in staff areas were much more socially acceptable than vinyl, the wearing qualities of some fabrics were short. Beds presented other problems and depending on the number of spars took a considerable time to clean.

In relation to accommodation for domestic services in new hospitals, this should follow the pattern of the Scottish Hospital Centre Information Sheet* and one room should also be set aside for the training of domestic staff. Provision of adequate office space was also important and good accommodation for changing purposes was an added encouragement for recruitment. Storage areas for trolleys, wheelchairs etc were also important to enable a clear run to be made while cleaning areas.

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* SCOTTISH HOSPITAL CENTRE. Domestic service room. Edinburgh, SHC, 1968. (Information sheet)

Regarding wall surfaces it had to be remembered that dust caused infection and good plain surfaces with no ledges were the most satisfactory for cleaning purposes. All washing or cleaning should be organised by the building supervisor and although washable paper was used in some hospitals this finish tended to deteriorate very quickly. The provision of buffer bars was important in this respect. In conclusion Mrs Saunders noted that points of detailing which made for particular cleaning difficulties only served to underline the need for consultation with the domestic administrator during the design stages of new buildings, and with such consultation and enterprising ideas hospitals of the future would be more easily cleaned to everyone's advantage.

MR G G SAVAGE, Secretary, Lanarkshire Health Board, gave an administrative view on the maintenance costs and related priorities. He recalled that in the Hospital Building Maintenance Report* of 1970 the definition of maintenance had been stated as "work undertaken in order to keep or restore hospital premises to acceptable standards of safety and efficiency having due regard to the needs of the patients and staff within their immediate environment, the requirements of the NHS and the resources available". Although some progress had been made since the early days of HM(48)40 and the concept of the Master of Works there still existed a backlog of building maintenance in the hospital field. It had been suggested in the Report as a rough metre stick for hospital authorities that, if a backlog of maintenance was encountered, the authority should seek the RHB's approval to a further annual allocation for a five-year period specifically to finance the arrears of maintenance work in addition to the normal annual allocation for maintenance. It was open for discussion however if this went far enough in finding a solution to the maintenance problem which some authorities undoubtedly had inherited. Balancing of budgets always presented a problem and with 70% of revenue expenditure being committed to staff costs and with some inevitable expenditure being committed to the remaining 30%, it was important to realise that budgeting was probably more a matter of managing establishments.

The responsibility of the building supervisor in devising a programme of maintenance was a severe test of balancing priorities. His allocation was always likely to be one of the first to be cut and any programme had to take careful account of inconvenience to hospital routine, the importance of undertaking essential maintenance at an opportune time and clinical considerations. He had also to be fully aware of the limits of the finance available to him in terms of the true purchasing value and also be prepared to cope satisfactorily with any financial 'bonuses' which might be made available to him near the end of the financial year. The building supervisor also had a role as safety officer for the building maintenance department and advising on aspects of the fire precaution arrangements with regard to fire escapes, ramps etc. This together with regard to preventive and protective maintenance called for skills in assessing time values, materials used and manner of work execution and required a considerable amount of technical knowledge to ensure a satisfactory assessment of priorities and an achievement of an optimum standard of workmanship within the resources available. As well as technical knowledge however, planning and the creation of programmes were essential to spend wisely. Importance should be attached to the feedback and feed forward of technical information and this should involve collecting details of failures in design and performance, of high maintenance costs, of new structures or finishes and assisting in the financial control and cost comparison of all the building maintenance within the Group. This

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* Department of Health and Social Security and others. Hospital building maintenance: report of the committee 1968-70. [chairman: David Woodbine Parish] London, HMSO, 1970.

included the implications of maintenance in relation to capital schemes and its likely effect on future financial allocations. The implementation and running of variable bonus incentive schemes were also relevant to the development of a satisfactory maintenance programme but in this connection the satisfactory supervision of such schemes was most important.

Of considerable significance towards achieving the ordered management and future effective conduct of hospital building maintenance was the planned inspection of and formal report on the building maintenance requirement at hospital and group level, the introduction of a comprehensive system for planning, financial control and the cost comparison of building maintenance work in hospitals and an amendment of financial accounts and cost statements so as to improve their use as tools of management. The new emphasis in Scotland on financial accounting would be particularly useful in this last respect.

DISCUSSION

In the course of the discussion sessions the following were the main points to emerge:-

1 Feedback

The importance of feedback to planning teams of information relating to buildings, their design, materials and equipment could not be overstressed since only in this way was it possible to avoid repeating defects which had occurred in other situations. Over the years since the publication of the Hospital Plan for Scotland in 1962 there had been difficulty in keeping together groups of multi-disciplinary staff with the necessary expertise in hospital planning and it was therefore essential that design teams should be fully aware of the range of guide material which was available. Known mistakes were undoubtedly being repeated in some new buildings despite efforts to disseminate information on previous experiences to the relevant bodies. Design-in-use studies were of particular value in this respect.

With the establishment of the Building Division of the Common Services Agency there would be a great opportunity to make a positive attempt to accumulate information of past experience which could be continually referred to at all the design stages. The Division would also have an important role in the monitoring of maintenance arrangements at Health Board level which should encourage more standardisation of practice in relation to the maintenance programmes. In the field of engineering it was particularly noted that early warning and defect and failure report systems if established and fully operational could provide information of considerable value to the planner.

2 Cost saving

Although future maintenance had to be carefully considered at the design stages of new buildings, the amount of finance available was clearly important in relation to the time and quality of finishes provided. It was normal practice for the architect to design up to the standards permitted within the cost allowance restrictions, but with price fluctuations, for instance in materials and labour rates, it was not uncommon for it to become necessary during a contract to make savings. This usually occurred at the later stages of a

scheme and, although it was relatively easy in the short term to reduce costs, this was invariably at the expense of the quality and life of finishing materials. This increased the maintenance burden in the future. It was also suggested that in relation to hospital building the client frequently expected standards which could not be provided within the available finance and this also was relevant to building standards and subsequent maintenance.

3 Consultation

Differing views were expressed as to the role of the building supervisor and hospital engineer at the planning stages of new buildings. On the one hand it was considered that with their experience at first hand, there would be advantage in having discussions before the scheme was off the drawing board to enable the designer to have the benefit of their knowledge and to enable the hospital works staff to grow up with and be aware of the design team's intentions. Alternatively over-consultation could take place which was time consuming and it was felt that in any event some points contained in what were complex plans could be overlooked or misinterpreted by staff not fully conversant with architectural or engineering drawings. In some respects there were advantages in adjusting situations as they occurred in the light of hindsight and there was invariably areas of 'no man's land' in every contract which had to be dealt with in an ad hoc way during some stage of the scheme. It was generally agreed however that in practice consultation between on the one hand the building supervisor and hospital engineer and on the other members of the design team was relatively infrequent.

4 Sanitary fittings and plumbing

Although in terms of maintenance costs work carried out in connection with sanitary fittings and plumbing represented 25% of the overall expenditure, it was suggested that more consideration might be given at the design stage to types of equipment and installations used in this sector with a view to reducing the amount of essential maintenance necessary at a later stage.

Scottish Hospital Centre
November 1973

Disposables

Meeting at the Scottish Hospital Centre on Friday 9 November 1973

Few hospital staff would advocate a return to the non-disposable era, but continuity of supply, shortage of raw materials, means of disposal and not least available finance were all factors most relevant to the use and development of disposables in hospitals. At this conference these and other points were raised in papers presented by a multi-professional group of speakers.

LORD PROVOST D McL McINTOSH took the Chair.

DR CAMERON WEYMES, Medical Director, Western Regional Central Sterile Supplies Service, in opening the conference noted that disposables were manufactured in approximately equal quantities of non-sterile and sterile articles. The main constituents were *paper* - wraps, bags, sheets, gowns - *pulp* - bed pans, incontinence pads and *plastic* - syringes, forceps, giving sets, drainage tubing. Various benefits derived from the use of disposable articles. An improvement in the quality of service was apparent with a noteable reduction in levels of cross infection which had made a major contribution towards safer hospitals and more contented patients. There was also considerable conservation of skilled labour in particular relating to nursing staff and some financial benefits compared with the more expensive 'permanent' articles many of which usually had limited recirculation.

In terms of planning, the introduction of disposables gave scope for the development of supporting service centres away from hospital sites which could enable a closer integration of clinical departments to be achieved. These services could cover laundries, CSSDs, food production centres and automated laboratories. By providing such service centres steam production on hospital sites could be reduced and more efficient distribution services could be developed with more central and departmental storage facilities. With a view to reducing the cost of disposables to a minimum level, consideration had to be given towards standardisation of products and techniques on a regional or preferably national basis and this raised questions relating to the levels of clinical freedom required by the medical profession and the extent to which the profession was prepared to accept standard norms of practice. Also in relation to cost, bulk buying had a considerable significance. For instance, in the Western Region, 68% of the cost of the service was attributable to raw materials and by placing large orders prices could in some areas be reduced by up to a half.

For the maintenance of hospital services, continuity of supply of disposable articles was essential. Manufacturers had to be in the position of guaranteeing the supply and delivery of essential items and there was inevitably a need for some degree of stock piling either by industry or at service level. Such continuity of supply was of critical importance at present with the world shortage of commodities such as oil, polystyrene - a basic ingredient of plastics - wood pulp and in particular

cotton. Certain technical problems could also arise in the use of disposables for instance in relation to the production of new plastics and in matters of residual gases and not least difficulties could also be encountered when one tried to dispose of disposable items.

In conclusion Dr Weymes noted that Scotland made an important contribution to research and development within the health services as a whole but, with the continuing and growing problems facing the service concerning disposables, great importance should be attached to liaison between the producers and the users to consider the development of articles and the real needs of the service. For this purpose it was suggested that it might be useful to set up specialist assessment units on a national basis to look at and evaluate certain disposable commodities available to the service.

MISS E A MEIKLE, Area Pharmacist, Southern General Hospital, Glasgow, spoke on the role of the pharmacist and her involvement in the supply of disposables. With the development of disposables such as syringes, catheters and surgeons' gloves in the late 1950s, the pharmacist, since he had supplied these items in the past, continued to take the responsibility for their supply.

The use and development of disposables at hospital level often depended on the amount of storage space available and, the pharmacy, where adequate facilities were available, was usually responsible for the storage and distribution of all CSSD items, disposable bedpans, urinals, incontinence pads, disposable nappies, paper towelling, etc. While it had been considered by the profession for some time that these items should be transferred to central stores departments it was likely that for a considerable time ahead the pharmacy would continue to be involved. With the development of CSSD depots over the country, quick cooling autoclaves had generally replaced dressing sterilisers and where possible it was considered this sterilising function should be linked with a TSSU service and not regarded as a pharmacy function.

Disposables had a most important role to fulfill since, with a significant reduction in their use, there would be an immediate cleaning/sterilising problem if items were to be used, resterilised and repacked. This would have to be done in a CSSD or TSSU,wards having no longer the space or facilities for this work and nurses no longer the training to clean, reassemble and sterilise items. Inevitably this would lead to urgent consideration of extending and developing existing CSSDs where space was already at a premium.

When a new disposable was introduced hospitals could be informed by way of promotional literature aimed at the hospital in general by a hospital equipment bulletin, where one could make a request for further information, by a visit from the firm's salesman or by staff attending outside exhibitions and conferences. Although difficulties could be encountered by similar products being on the market, pharmacists were trained to assess products and interviewing representatives was a daily occurrence. When a new product was marketed, the pharmacist would want to know the cost, what the new disposable was replacing, whether the product or a similar product was already available from CSSD, the dependability of the source of supply and availability of raw materials and the possibility of a free trial being undertaken at hospital level to assess the product under practical conditions. If agreed that items

should be kept in stock, where possible, they should be supplied to wards and departments on a topping-up basis to achieve the maximum economy of nursing time and space at ward and department level. In the initial stages of introducing a topping-up scheme a great deal of work was required by the pharmacist but once underway the system could be run very successfully by junior staff. With the world shortage of raw materials supply problems were bound to increase and it was important to ensure that stock was used correctly.

If it was agreed that pharmacists should not be so involved with disposables the question would arise as to who should take over this responsiblity. In England Supplies Officers fulfilled this function. It had also been suggested that nursing administration should be responsible for the ordering of disposables because they used the product and knew what was best for the patients. It was doubtful however if the nurse would be aware of all the financial implications and problems of stock control. CSSD Supervisors who were often trained nurses, generally were aware of cost implications and given much more space, a larger staff and delivery vehicles, the supply of disposables could be seen as a natural extension of their existing work.

In conclusion Miss Meikle considered that most pharmacists would be prepared to hand over the purchase, storage and issue of all disposables if they could be sure that they would be looked after efficiently and intelligently. This would enable them to concentrate on developing their expertise on the medicinal substances which they issued. Until there were substantial developments in the facilities available at CSSDs, however, it was likely that pharmacists in Scotland would continue to be heavily involved with the supply of surgical disposables.

MISS E A REID, Nursing Officer, Scottish Home and Health Department, indicated that it was unlikely that any nurse would advocate a return to the not so distant past and non-disposable era when nurses were obliged to undertake a range of practices now considered obsolete. As a principle the use of a disposable item with the requisite properties and necessary characteristics, which at no point required the wasting of skilled time in non-productive preparation and reprocessing, had much to commend it. The use of disposables in patient care was undoubtedly not in question. The explosion in the range of disposables, however, had generated problems of its own. It was essential that any system, practice or policy affecting patient care was kept up to date and under continuous appraisal so that demands brought about by advances in medical technology and rising standards of living could be met.

The value of a product could not only be measured in financial terms. The reduction in number of procedures and consequent 'freeing' of nurses' time had not caused a reduction in the number of nurses employed since this so called 'free time' was made available at the expense of the patients. Although disposables had undoubtedly greatly facilitated progress in nursing care, the stage had however not yet been reached when nurses were wholly employed in practicing their craft and in using their technical skills. It was also relevant to note that with the policy of early ambulation in acute units and a high proportion of ambulation in long stay units, some products suitable for the use of the bedfast patient did not meet the needs of the non-bedfast. This was equally relevant to community nursing services where a large increase in the number of elderly persons living in the community could be expected in the future.

Two main groups of disposables (1) products essential for patients investigation, diagnosis and treatment and (2) products, not normally sterile but hygienically clean, which facilitated the individual care of the patient - could be identified. Difficulties could arise in practice in relation to both groups - in the selection of products, in communications and the dissemination of information, in the availability and maintenance of the service, in storage, in packaging and in the disposal of the products.

Communications and the dissemination of information were related to the selection of products. There seemed in some instances to be a lack of standardisation in the products. Occasionally those issued did not meet the needs of the patient and were adapted for use which was time consuming. The Salmon structure had tended to encourage discussion amongst nurses on the selection of products which had important implications for nurse teaching and training. Schools of nursing should be included when procedure manuals were drawn up and products specified and there must be continuity from the schools to the hospitals if nurses were to use products to the best advantage and in the interest of their patients. With the increase in range of disposables available it was not easy to obtain guidance on the characteristics of individual products and there was also a need for more product evaluation studies. Maintenance of a service and availability of products were also most important factors. It was important that the quantities supplied met the demands of the situation.

In relation to storage, the quantity of items held at ward and departmental level was variable and dependent on the system of supply. This in turn was influenced by available storage space and manpower in other situations. In units with an erratic supply a considerable amount of money could be tied up at ward level which might be avoided with a more systematic method of supply based on demand. It was wrong for instance for ward preparation rooms to become miniature stores. Overprovision of products offered additional hazards in relation to sterility, damage to containers, fire risk and contamination by ward dust.

On packaging, getting into the product was now not so difficult although the volume of packaging left after certain procedures could be substantial. One of the greatest changes had been the supply of products in their own dispensers by manufacturers and this had obviated the need for purpose-designed dispensers at ward level.

In conclusion Miss Reid suggested that there was a need to set up multi-disciplinary liaison committees at hospital level to discuss the updating of the selection of products and to identify the ranges to be held. There should be an organised system of supply avoiding the hazards of the accummulation of stocks at ward level, a wider dissemination of information on new products and a clearer definition of whom manufacturers should turn to in providing information on their products. For the nurses it was necessary to review constantly and standardise practices in relation to disposables and for everybody to recognise the danger in using these items making sure that they were not used as nursing expedients and as a source for the promotion of poor nursing practice.

DR H G SMYLIE, Consultant Bacteriologist, Aberdeen Royal Infirmary, considered the effect of disposables in relation to cross infection. He indicated that disposables, used wisely in the correct situation inside hospital disposed of both sources and transmission routes of cross infection.

The practice of the use of disposables by hospitals had gained enormous momentum over the past 15 years and had contributed significantly towards safer hospitals and more contented patients. Acceptance by staff had been slower to appear but with the growth of CSSDs and the efficient organisation of sterile supplies, early consumer resistance had been broken down and now specialists in every field of medicine were on the search for even more sophisticated disposables as an aid to their treatment of the patient.

Resistance to disposables now originated mainly from hospital administrators who objected to the apparently relentless increasing cost of a non-stop supply of these articles. Their objections were undoubtedly justified in some cases when one considered some of the articles produced by an over-enthusiastic and sometimes ill-informed manufacturing industry. Yet the greatest and most unnecessary expense faced by any administration was the cost of the patient who remained in hospital longer than he should because he had contracted hospital cross-infection.

If control of infection was made the acid test of rational usage many benefits would accrue. Prior to the introduction of disposable syringes and needles, it was the commonest bacteriological observation to detect reprocessed needles blocked with blood products or syringes in an unsterile state. These were the days of frequent syringe transmitted serum hepatitus in VD and diabetic clinics and 70% cross infection rates in urological patients. On the introduction of the disposable needle, syringe and catheter, cross infection rates were impressively reduced. Other benefits accrued. Because bulk processing demanded it, improved methods of sterilisation such as gamma irradiation became the norm rather than the exception. The cutting edge of the disposable needle was now constantly more efficient than the "hooky" reusable which often tore painfully into patients. The tensile strength of the plastic catheter allowed the same luminal diameter of the older catheter to be reproduced in a thinner model while modern plastic air-blasting techniques ensured comfortable lubricity. Thus the disposable catheter not only disposed of the source and mode of transmission of urinary tract cross infection, it was more efficient in use and less traumatic to the patient. Furthermore because of the way in which these articles arrived they immediately decreased general hospital staffing needs; conserved nursing skills and time; and ensured ready availability in conditions of fluctuating demand - all accrued benefits contributory to the control of infection in modern hospitals.

It would be wrong to assume that the application of disposables concerned only those small items of hardware which could be replaced as plastic imitations. If equipment could not be sterilised, there was a place for its replacement with a plastic disposable whether it be large or complex. For instance some modern anaesthetic machines recirculating anaesthetic gases represented an insoluble sterilisation problem and a serious cross infection hazard to surgical patients. Disposable anaesthetic circuits were now becoming available and only these would solve this type of problem.

Where the sources and modes of transmission of cross infection remained obscure, there might still be a case for the application of a disposable, if only to clarify the epidemiological problem. As an example a demonstration film of the application of the Trexler isolator (a "disposable operating theatre") to hip surgery was presented. Because the isolator controlled the airborne infection hazard to this type of surgery, the isolator might yet resolve questions on the aetiology of infection following prosthetic surgery. If so then a relatively expensive disposable item might prove less costly to the health service than ongoing experimentation with expensive permanent laminar air-flow modifications of existing operating theatres such as were currently fashionable.

In conclusion Dr Smylie indicated that disposables wrongly designed and used might promote cross infection or become fresh sources and reservoirs of infection. For example there were already reports of skin infection in patients using disposable paper bed sheets and the reprocessing of a disposable for re-use would only restore the vicious circle of hospital cross infection.

MR H A SMEDLEY, Senior Engineer, Scottish Development Department, discussed disposables and their method of disposal. He recalled that Local Authorities received contributions as rates for all hospitals in their areas and it was their duty to collect and dispose of waste materials. There was no reason why they should not dispose of anything required of them provided it was not potentially infectious, dangerous or aesthetically objectionable. Accordingly there had to be segregation of waste into suitable and unsuitable items. This could not be carried out in a haphazard way and had to be done at the place where a disposable became an item for disposal. This meant that it usually fell to the nurse to separate the waste into the right containers. Disposal systems however often failed because the system of segregation did not work in practice. Nevertheless hospitals should make efforts to sort out all materials which the LA could take away, placing them in the allotted container. The probability however was that by the time advice had been taken from the proper authorities and all the waste which could not go to the LA placed elsewhere, not much was left for the refuse waggon.

Toilet paper was a disposable which had been in existance for many years and on the whole had caused little trouble with its disposal. Many other disposables, which were said to be suitable for disposal in this way, in fact caused no end of difficulty unless the drainage system was perfect. Most of the old large buildings forming the major part of Scottish hospitals did not however have such perfect systems. A vast number of items was therefore left which had to be disposed of in some controlled manner other than via the Local Authority or the drains. Three possibilities existed - *burning*, *shredding*, or *packing* in some special manner for transmission to some other body.

Incinerators which complied with the requirements of the Clean Air Act were sophisticated furnaces, prone to abuse and requiring constant attention to maintain them in working condition. Although they were designed to burn refuse with up to 25% plastic content, on many hospital sites they were required to deal with waste containing up to 40% plastic. Exploding aerosols, also, if they did not shatter the white hot lining of the furnace, damaged the sensitive temperature measuring devices which were essential for the proper operation of any incinerator. It was recognised that incineration properly achieved produced a sterile end product from what would otherwise be a source of infection. Large

amounts of natural organic materials were being converted into hot gas and chemicals usually with no hope of recovering the energy released by the process. It was open to question how long the necessity of recycling waste products could be avoided.

Modern shredding, mincing or macerating disposal units were available which dealt with a wide range of materials from glass and hard plastic to soft fibrous matter. Many things however went wrong in practice although much of the trouble stemmed from misuse. For instance when some of the machines were working correctly a water supply was used and water droplets might be created carrying the risk of spreading infections. In modern machines this risk had been recognised and dealt with but it still required fairly large quantities of water if the treated waste was to flow down the drain and not create a blockage. Here again problems of water shortages in certain areas were relevant.

Parcelling up the used disposables and sending them elsewhere was not completely impracticable. It might be that, with proper security, it was better to send some items such as disposable syringes to some places with proper facilities rather than to attempt some less than satisfactory disposal on site. This however was hardly practical for any large scale operation.

There were several novel systems of disposal available on the market that had great possibilities. Equipment existed which could shred refuse and suck it by vacuum down a special pipework system to a central collection point, but such systems were expensive and extremely difficult to put into existing hospitals. It might be, however, that a foolproof efficient machine was being developed for the market although it did appear that progress in this direction had been somewhat slow in recent years. Success in disposal of disposables depended and was likely for a long time to depend on a high degree of co-operation from nurses and other users and an uncomfortably large deployment of maintenance engineers on the maintenance of disposal equipment.

MR L M WILLIAMS, Treasurer, Lothians Health Board, raised the financial implications for the service of the development and use of disposables. Three questions could be posed - How essential were disposables? - Could we afford disposables? - How did we control and assess the cost benefit of disposables?

Three categories of disposable could be identified; (1) disposables, essential for the wellbeing of the patient, eg catheters, drip sets, needles; (2) disposables which afforded greater convenience to the user and saved time, eg bedpans, dressing packs; and (3) disposables which were desirable but not a necessity, eg cups, sheets. Regarding these articles it was questionable whether the Health Service put them in the correct order of priority. It had to be accepted that there was a limited sum of money available for health care and in real terms its growth rate was very limited - no more than 3½% (£6 - 7m) per year over the last few years and liable to be reduced in the immediate future. It could be argued that only 6½% of the total expenditure was on medical supplies and, as this was relatively small, it should be possible to increase this amount. But this had to be considered in the light of the true financial situation. For instance in the South-Eastern Region just over £1m, representing 2½% of the total budget was spent on disposables in the last year and this compared with £4 - 5m for Scotland.

Problems clearly existed in assessing the cost benefit of the use of disposables. For instance in relation to disposable theatre drapes, which had been generally accepted and favoured by medical staff, it had been estimated that the cost involved by their use was £1.16 per operating hour or in total figures £100,000 for the SERHB representing £½m for Scotland. Again in relation to home dialysis machines until recently a type of sandwich filter had been used costing £1,500 per patient per annum but now with the introduction of a disposable coil the cost would rise to £3,000 which for 20 patients cost £30,000 extra per annum.

It was also doubtful as to whether the use of disposables was satisfactorily controlled in hospitals. Each year Boards spent considerable time deciding priorities in development needs for additional consultants to reduce waiting lists and to consider nursing establishments for hard pressed long-stay hospitals but it was doubtful whether disposables came into the priority list. It was in practice much easier to initiate an increase in supply expenses than to obtain an increase in staff establishment. There was always a built-in tendency towards introducing labour saving devices and this could often be supported by vague promises of staff saving. It was also very easy for items initially introduced on an experimental basis to become accepted as a routine part of the service pattern.

In conclusion Mr Williams noted that there were clear advantages to be gained by the use of disposables in relation to the control of cross infection and reduction in patient length of stay and these were generally accepted. However to contain the development in use of disposables within the acceptable growth in financial terms of the service, it was important to emphasise the importance of standardisation in relation to the types of products being manufactured and purchased and to encourage competition between suppliers to ensure an economic price.

Scottish Hospital Centre
November 1973

The nurse and research

Meeting at the Scottish Hospital Centre on Tuesday 20 November 1973

During this conference papers were presented by three nurses on their current research work at the Department of Nursing Studies at the University of Edinburgh. Reviews were also given of current Scottish Home and Health Department nursing manpower studies and the work of the Nursing Research Unit was described by its Director.

DAME MURIEL POWELL took the Chair

MRS SENGA BOND, Post-graduate Research Student, Nursing Research Unit, University of Edinburgh

People with cancer: an aspect of communication in hospital

Mrs Bond indicated that her study of communication of information to patients who had cancer was initiated because of several reasons: (1) Personal experience had made her aware that problems existed (2) There was a lack of research in this field (3) Changing age structures and more sophisticated methods of treating cancer would be likely to increase the number of patients with cancer in hospital.

The basic data for the study were the interactions between patients and hospital staff as they provided a context for the exchange of information. The work of Glaser and Strauss* dealing with the awareness contexts and social interaction was considered the most appropriate theoretical framework. They used the substantive area of dying to develop the theory and typology of awareness contexts. By awareness contexts was meant what each individual in a situation knew about the identity of the other and his own identity in the eyes of the other. They considered that this related to awareness about dying and the patients' and other individuals' knowledge of the patients' eventual fate. Awareness contexts were formulated from the observation of interactions between patients and hospital staff, but awareness contexts were larger than the immediate personal interaction. These surrounded and affected the interaction just as the overall physical context within which an interaction took place could be an influence. Awareness contexts were analytical social units which accounted for differences and similarities in behaviour and were the most useful explanatory variable in determining talk and action around dying patients.

The generality of the theory made it applicable to other areas. This study of patients with cancer who were in hospital involved cancerous conditions of all types - including curable, incurable and terminal.

An important factor concerning patients suffering from cancer more than with patients with less sinister illnesses was whether patients were aware of the diagnosis. In the hospital department in which the study had been conducted, all staff members were aware of the diagnosis but

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* Glaser, B.G. and Strauss, A.L. *Awareness of dying*. London, 1965.

also about attendant features of the disease. Staff were unlikely to know, at least initially, the patient's awareness state about his condition. How they came to know and the organisational features which helped determine this were part of the study.

In relation to the situation of open awareness, where both patient and staff were aware that the diagnosis was cancer and was acknowledged through their actions, this did not mean resolution of interactional problems but rather added to their complexity. To create awareness about diagnosis meant that the patient was in a position to quantify this knowledge and might wish then to know - "Am I going to die? Will I be disfigured? How long? Will I have pain?" Awareness of those features of the disease might vary while there was openness about diagnosis. Awareness would be influenced by factors like the patient's degree of medical knowledge, his experience of others with cancer and his observation of other patients suffering from cancer.

To a large extent the handling of information about cancer, apart from diagnosis, created problems for nurses. Such problems increased suspicion or greater open awareness contexts when the patients asked for details of the extent of their illness, the meaning of symptoms or why particular examinations were being carried out. Open awareness had consequences for patients, eg decisions about whether to continue treatment, how to organise his life, or how to deal with particular emotional responses which were triggered. The situation of open awareness created for nurses the satisfaction of being able to communicate fully with patients but also raised difficulties when distressing topics emerged.

The methods used to collect data were fieldwork techniques, observation of events as they occurred together with the reports of participants about events. Observation in this hospital setting involved a rapid turnover of patients and this provided a number of different categories of patient as well as a repetition of various series of events. The role adopted varied as the observer was a participant and the participant was an observer. These roles permitted a mass of data to be collected at close quarters but also involved the investigator's own emotional responses. Monitoring of these responses provided a further source of data.

In conclusion Mrs Bond noted that work in the field had covered a period of several months and as well as observation, formal and informal interviewing techniques had been used. The study was now part completed and the data collected to date was being analysed.

MISS LAURIE CHISHOLM, Scottish Home and Health Department Training Fellow, University of Strathclyde.

Some attempt to quantify nursing activities in long-stay situations

Miss Chisholm noted that her project, which had not progressed beyond the exploratory stages, had evolved from a study involving a mental defective hospital carried out by members of the Health Services Operational Research Unit at Strathclyde University. The main objectives of her study were (1) to describe and compare the patterns of nursing work in various long stay areas, (2) to provide some quantifications of nursing activities in relation to grades of personnel, types of wards, staff levels and mixes and patient characteristics and (3) to provide information for discussion which could possibly serve as a foundation for later experiments. Several exploratory studies had been carried out and

the details recorded varied in four pilot investigations. In two female psycho-geriatric wards, few details - time, nurse, grade, patient, activity - were collected. Subsequent observations in psychiatric, geriatric and general units involved the collection of additional data including number of patients in nurse/patient contact, grades of nurses in any joint activity, patient data, periods of nursing time spent on the ward, etc.

Activities were considered to belong to one of five main groups, each consisting of several sub-categories of activities which resulted in a total of 34 classifications. The major areas related to (1) *Care* which enables identification of basic and technical elements (2) *Surveillance* which also delineated some basic and technical differences and (3) *Group activities*.

Clear differences in the work patterns emerged between different types of wards. For instance the two sets of psycho-geriatric wards were closer to each other than to the general hospital wards or to the other types of psychiatric wards. In psycho-geriatric wards the proportions of contacts initiated by individual nurses and "hotel" activities were high, the other components being comparatively low. Individual contacts initiated by patients and individual social contacts also appeared to be more frequent with increased staffing levels. There was also some indication that "hotel" requirements existed at a fixed level for a given group of patients with the proportion of "work" time decreasing as the number of staff increased.

Differences were also apparent in relation to patient contact. In general wards the mean contact time was 55% of all observations with only 1% of this involving groups of patients. In a cross section of psychiatric wards based on data collected in the North East Hospital Region the contact value was 45% with group activities accounting for 21% of this. Also in a study involving six mental defective wards the mean contact time was 28.5% with 12% of observations involving group work. This seemed to indicate fundamental differences of work patterns in these areas. In the wards which were observed for two days there was in each case an increase in patient contact time when staffing levels were higher. It was however difficult to account for the differences purely in staffing terms since when the nursing time available per patient during each hour was examined, the general wards averaged 5.37 minutes compared with 7.6 minutes and 8.9 minutes in mental defective and psychiatric wards.

Patient characteristics were also examined as part of the study. The pilot recordings were converted to time equivalents in order to assess the relative proportions of time spent with patients in the different dependency categories. These values were available for patients in three general wards using the Aberdeen dependency criteria.

Emotional and social factors relating to patients could also be relevant to the ideal expenditure of nursing time. A subjective measure was devised but on analysis no clear pattern emerged which could be compared with the relationships of "care time" to physical states.

Educational implications were the final topic of the study. In four general wards teaching or learning could have occurred during 20% of the observations. Overt teaching or learning activities occurred in one ward only, accounting for 0.4% of all recordings. For the remainder this aspect of nursing function did not appear to apply either because the nurse was working alone or because equivalent grades were working

together. The teaching opportunities which could have been utilised were 1.3 and 1.6% for sisters and staff nurses respectively, 6.9% enrolled nurses and learning situations on 3.7 and 5.9% of occasions for student and pupil nurses.

In conclusion Miss Chisholm indicated that it would be inadvisable to draw conclusions from a limited study but since there were indications of agreement with findings of more complete studies the objectives might provide new information of value.

MRS HEND ABDEL-AL, Post-graduate Research Student, Nursing Research Unit, University of Edinburgh.

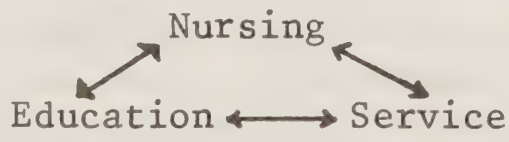
An approach to nurse education

Mrs Abdel-Al considered that the problem she had been investigating for the last four years was very complex in nature. This reflected itself on both the method of investigation as well as on the possible results. Because of the complexity a synopsis was essential.

Her direct field of interest was Nurse Education, the aspect of which being studied was 'Relating theory to practice', ie, relating education to service in nursing.

The word "relate" had been used rather than "integrate" as the process involved was different. According to the dictionary definition "relate" meant: bring into relation, establish relation between... while "integrate" meant: combine into a whole. In the first instance there was the implication that two or more objects or subjects were identifiable by certain characteristics, they had certain boundaries, and the process of relating them entailed finding the similarities and differences between or among them. The former was clearer and more defined as a process while in the latter there was an implication that the outcome of the process was a whole where the parts were not easily identifiable. Blurring of the boundaries resulted in the process being difficult to study or plan.

Both education and service entailed planning, organisation and execution, of a formal programme of preparation. Before undertaking such a task in education two things needed to be established - the context and purpose of the education which was to take place and the nature of the service. The study of the relatedness could be demonstrated thus:-



From the literature one could infer that the nurse required was one with enumerable abilities, knowledge, skills etc. A study of the syllabus and training showed a sum total of 'compartments' which were not clearly defined and without a clear relationship between them.

The literature showed a tendency towards the study of some of the variables involved in the complex situation. Unfortunately this led to results that were not representative of the real situation. Parlett and Hamilton (1972) referred to the artificiality of a controlled situation and indicated that "rarely can 'tidy' results be generalised to an 'untidy' reality". It was necessary to take into account the reality of the situation and not be disappointed when coming out after a long period of research with 'interesting' results in which reality had no relevance.

From the survey this lack of appreciation of reality by teachers came out clearly and consequently before planning education for nurses one had to answer the question: "Do we want to prepare a nurse capable of coping with the real situation?" If "yes": "How would we define a nursing situation to use as a guide?" and "How would we define coping: dealing with parts of the situation at a time? or dealing with the situation as a whole, as the situation presents itself as a whole?"

As far as her research was concerned, Mrs Abdel-Al noted that she had tried to define a nursing situation and assumed that what was required was that the nurse would be able to deal with that situation as it presented itself. This idea was tried in an experimental course of teaching the psychiatric seconded students, as a means of relating theory to practice more closely and developing the ability of the student to cope with the problem.

In summary the approach consisted of a systematic way of organising thoughts and understanding about nursing to make maximum use of the potentials present. It was a way of planning, organising and executing nurse education to enable nurses to: "practice what was preached" to which could be added "but essentially to preach what was practicable".

Scottish Home and Health Department Manpower Studies and Review of Salmon Structure

MISS M H S HUNTER, Nursing Officer, Scottish Home and Health Department, indicated that in 1972 all qualified nursing staff in the Scottish Hospital Service were circulated with a questionnaire. A similar questionnaire was circulated one year later to all qualified nursing staff in the Community Nursing Service. The response rate was just under 95% from the 21,000 distributed in the Hospital Service and 98% from the 3,300 distributed in the Community Service and this demonstrated the profession's appreciation of the need for manpower planning. As a result a profile of the nursing profession in Scotland now existed. This included age, sex, hospital, Board of Management, qualifications, grade, field of nursing, hours of work, travel problems, family commitments and pattern of employment over a 10 year period and the analysis of data was being undertaken by the manpower branch of the Department with the Institute for Operational Research. To ensure that the analysis was meaningful and produced the correct management tools for nurse administrators an implementation study was being carried out in six areas in Scotland, three in greater detail than the others. These areas had been chosen as representative of the manpower problems which faced the profession. From this it was hoped that nurse administrators would be able to identify earlier and more reliably the manpower problems they might face and enable them to make the best choice between alternative courses of action. For example, a bulge in full-time nurses between the ages of 45 and 55 could be demonstrated. These could be post-war recruits and would pose a problem when a large number retired or it could be due to people recruited to the profession later or alternatively qualified nurses joining the Service later.

Another part of the study was that of entrants and leavers to the profession. Monthly returns were made from all hospitals over a one-year period and from these it was known that 1/3 joined and left annually 25% of these being female and 12% male. It was important to know much more about the movement and this study would yield valuable information. It was planned to publish the tables in January and the report in 1974.

As from January 1969 a computer based record had been maintained for all students and pupil nurses entering training. A cohort analysis of a whole calendar year's intake was therefore available. This would provide information on the numbers who left training and the period they left and this would be analysed separately for different types of training. From such information it would be possible to forecast the output of the nurse training system. In 1972, 1,400 nurses registered and it was estimated that in 1975 there would be 1,800. In 1972, 1,200 nurses enrolled and it was estimated that in 1974 this would be 1,400. Aggregate figures from the cohort analysis would be made available for Schools of Nursing.

MISS J E D HILL, Nursing Officer, Scottish Home and Health Department, gave a brief outline of the review at present being undertaken on the nursing administrative structure since the implementation of the recommendations of the Salmon Committee.

The evaluation at present being undertaken was due to the re-organisation of the Scottish Health Services on a much wider basis than originally conceived in 1968 when Salmon Pilot Schemes were in operation. It was realised that the forthcoming re-organisation would necessitate some restructuring of nursing administration and it was therefore important that there should be a sound structure on which to effect a change. Accepting this and acknowledging that the profession itself had expressed a desire for an evaluation of the effectiveness of the nursing administrative structure, it was decided towards the end of 1972 that it was an appropriate time to undertake such a study. After consultation with the CRNOs of the Regional Hospital Boards a small Steering Committee under the Chairmanship of the Department's Chief Nursing Officer was established to identify the particular areas to be studied and the methods by which evaluation could be achieved. It was agreed by this Committee that the nursing administration in 12 hospital groups all of different size and geography and which had been operating the Salmon Senior Nursing Staff Structure for at least 2 years should be studied. The particular areas requiring investigation were identified as (1) middle management; (2) consultative and decision making; (3) accountability and span of control; (4) communication between disciplines; (5) the role of the specialist nurse; (6) standing-in and acting-up roles and (7) job descriptions of the different staff grades.

It was decided that the best way to test subjectively the reaction of nursing staff in the grades ward sister and above was by way of an attitude study and this could be undertaken by issuing a questionnaire to nurses in these grades. To ascertain the validity of the questionnaire a pilot study was undertaken within the Edinburgh Royal Victoria and Associated Hospitals. Following analysis of the data collected and interviews with some of the staff involved, the questionnaire was amended and circulated to members of the Steering Group for comment. The questionnaire was then issued to the 12 hospital groups selected for review. This involved approximately 3,000 staff including charge nurse level and above together with a 25% random sample of staff nurses and enrolled nurses in each hospital group. On completion of these questionnaires the Department would carry out an analysis of the data and the results would be made available to the Health Service in due course.

Activities of the Nursing Research Unit

MISS LISBETH HOCKEY, Director, Nursing Research Unit, Department of Nursing Studies, University of Edinburgh, in giving a progress report on the work of the Nursing Research Unit, indicated that it was important and valuable to obtain the reactions and opinions from an informed audience of senior nursing staff in order to consider if and how the unit could be more helpful to the profession.

A brief account of the educational activities was given and it was reported that during the year the course on "Research applied to management and education" had been repeated. Participants had included officers from England as well as some European countries. A slightly extended course of this nature was planned for 1974 and also a course "Introduction to research" for nursing officers in the Hospital and Community Nursing Services who had a research component in their job description. A new venture was a study half-day for a small group of student nurses from Edinburgh teaching hospitals which was shortly to be followed by a discussion with their tutors in order to determine if and how such activities should be pursued. The ready help given by the Rcn Scottish Board and the Queen's Institute of District Nursing (Scottish Branch) was acknowledged in mounting jointly planned courses for other groups of staff such as staff nurses, ward sisters and charge nurses, district nursing sisters and health visitors. Whenever possible members of the Unit's staff as well as Research Fellows had accepted invitations to contribute on various aspects of research to courses held by other organisations.

Information collected for the Unit's research project "A study of women in nursing" was currently being analysed and prepared for publication. Although some of the data collected was similar to the SHHD census there were several fundamental differences in approach, methods and objectives and the findings were expected to provide useful additional and complementary information. The study was undertaken in four hospital groups and adjacent local health authority areas. A random sample of female nursing staff including pupil and student nurses and ward sisters was interviewed and personal interviews were also arranged with all nursing administrators. Most research studies exposed areas for further enquiry. The Unit's study was deliberately planned to provide pointers for the next stage of the research programme; for example sections on working hours, on views regarding auxiliary staff, on views relating to aspects of patient care were built into the interviewing schedules for this purpose and the staff's reactions to the approaching integration of the Health Service were sought.

Tentative plans for further work included a study of the feasibility of flex-time in nursing, a study of the auxiliary work force and a long term study monitoring the process of integration in relation to patient care. It was also hoped to be able to mount studies in the clinical nursing field. Miss Hockey stressed the needs for experimental studies which could show differences between various methods of delivering nursing care; a possible study comparing patient allocation with task allocation was mentioned as having considerable potential value.

In order to sustain an ongoing research programme it was necessary to plan ahead. The preparation of research proposals, not only for approval by SHHD but also to attract funds from other grant giving bodies such as foundations, was an important but time-consuming activity.

Other Unit activities included attempts at indexing available research material thus making it accessible and useful and to keep a record of places in Scotland where nursing research was being undertaken.

With the new framework for Government research in Scotland and the formation of the Chief Scientist organisation it could be expected that requests for research might come from that Committee to research units such as the Nursing Research Unit, which to date was still the only unit of its kind in Britain. The type of requests would conceivably be determined by the needs for specific projects and by the interests and expertise of the researchers. Research, like most other areas of knowledge, was rapidly becoming more specialised in a variety of techniques and it was no longer possible to be knowledgeable about 'research' in general terms. Comparative evaluative studies of the kind mentioned would be in line with the interest and background of some members of the Unit's staff.

In conclusion Miss Hockey emphasised that research had to be a team effort between initiators, implementers and doers. Suggestions and ideas had to come from members of the profession who were encountering problems whether in direct patient care, in management or in education. A plea was made for the profession to make its needs known and to continue the encouraging contact with the Unit and it was stressed that today's research might be of benefit for tomorrow's service, thus hopefully helping the patient in whose ultimate interest alone nursing research could be justified.

Scottish Hospital Centre
November 1973

Laundries and topping-up

Meeting at the Scottish Hospital Centre on Friday, 30 November 1973

The overall objective of a hospital linen service is to maintain adequate supplies of clean and serviceable linen to the user departments at an economic cost. This can only be achieved by the closest possible co-ordination of laundry operations and linen distribution services. At this conference a wide variety of views and criticisms were expressed on the type and quality of service presently available to hospitals and several points - not least inadequate supplies of linen stock - were identified as being relevant to the provision of a less than satisfactory service in certain situations.

EX PROVOST R H BANKS took the Chair

MR R MAXWELL, Laundry Adviser, Scottish Home and Health Department opened the conference by quoting from a recent document published by the Department of Health and Social Security - "In 1948 the National Health Service inherited a large number and great variety of hospital laundries. Many of the smaller uneconomic laundries have now been closed and replaced by large modern laundries serving more than one hospital and sometimes more than one group. The process of rationalisation with the building of fewer but larger and more economic laundries will continue. After re-organisation, such laundries will often be responsible for providing a linen service for several districts and occasionally for more than one area". It was likely that similar developments would take place in Scotland and, although the size of new laundries was uncertain, they were likely to be in the range of 100,000 to 150,000 articles per week.

At present the majority of laundries in Scotland provided a laundry service. This could be defined as the receipt, processing and despatch of all soiled linen sent to the laundry. There were three separate entities who had involvement with linen - the nursing staff using it, the laundry processing it and the administration providing and replacing it. There was, however, often little or no co-ordination between these three bodies. The situation could frequently occur where the laundry was processing the work load to its required schedule, the administration was replacing items as they were condemned and the nursing staff did not have adequate linen to meet their requirements. This split function of the linen involvement therefore allowed a situation to develop without corrective measures being taken. Quite often the system was workable either because the laundry was on the hospital site enabling close contact with the wards or because laundry staff worked overtime at week-ends and public holidays.

The overall objective of a hospital linen service was to maintain adequate supplies of clean and serviceable linen to the user departments at an economic cost. This could only be achieved by the closest possible co-ordination of laundry operations and linen distribution services. The basic principles which must be observed in organising such a service were:-

1 maximum standardisation of articles in order to simplify laundry operations and linen distribution procedures

2 a system geared to the current needs of the user departments

3 an appreciation that total stocks within the linen cycle could be at least seven times the daily average usage plus additional to cover statutory holidays, transportation delays and laundry breakdowns

4 collection and delivery delays must be reduced to the minimum and

5 the abolition of linen inventories at individual hospitals and greater centralisation of linen and laundry services.

Among other things it had to be accepted that basic articles of linen would be freely interchangeable between hospitals, linen marking would be greatly reduced and simplified and sewing rooms at individual hospitals would become unnecessary. Also a 'linen service', as opposed to the existing 'laundry service', must come under the control of a single authority. This authority could be designated as 'linen services management' and would be responsible for the establishment of correct linen stocks, the replacement of articles due to condemnation or loss, the operating of a budget for the same, the central linen operation, laundry operation and transportation to and from ward level.

In relation to the central linen operation, four main systems existed -

1 topping-up from a hospital linen room

2 requisitioning from a hospital linen room

3 exchange trolley system direct from a central linen room

4 daily quota direct from a central linen room

The topping-up and requisitioning methods required a hospital linen room to which the laundry made a bulk delivery of articles which could either belong to that hospital or on a group or area basis. These methods were not particularly economic, having to use staff and space at hospital level. From a laundry point of view it was felt that due to the greater control these methods gave they were preferable when linen stocks were not as adequate as they should be.

The exchange trolley could be packed from the laundry central linen room, and a new district general hospital was an ideal situation for such a system particularly when it was designed at the planning stage and did away with the requirement for ward linen storage. Some older existing hospitals, however, were not suitable due to variations in floor levels and geographical spread of wards.

The daily quota system was very similar to the exchange trolley system in that a pre-determined day stock was issued direct from a central linen room; it differed only in the physical methods of handling the linen.

Central linen schemes using a daily quota system had recently been instituted and they had proved to be most successful when allied to a linen services set up. This involved a number of radical changes in administration and operational policy including

1 the inauguration of a linen bank at the laundries with common user linen from each hospital being pooled and placed on a communal basis

2 rationalisation and standardisation of common user items

3 the setting up of an area linen store and area sewing room

4 introduction of daily quota deliveries

5 purchase of additional stocks of linen

6 construction of a management system in which laundry managers were responsible for clean linen production, repairs, replacements and distribution to hospital linen areas

7 the removal of hospital's responsibility for their own linen and central marking of linen with one stamp and

8 creation of a central cost control whereby each user was charged a laundry cost on bedding and linen repair, replacement cost and a linen loss cost depending on volume of usage.

In conclusion Mr Maxwell noted that in his experience an adequate linen service could be instituted to suit users' requirements provided that the large laundry concept was accepted. Such a concept gave a more economical and trouble-free service and one requiring less nursing involvement.

MR T G CLARK, Chief Work Study Officer, Eastern Regional Hospital Board, discussed linen systems and the effect of incentive bonus schemes. He observed that the objective of a hospital linen service was to maintain adequate supplies of clean and serviceable linen at a reasonable cost and that this could only be achieved by the closest possible co-ordination of laundry and linen distribution services. The laundry itself was therefore only one (but essential) link in the total system.

It was evident that any consideration of laundry productivity should be preceded by careful consideration of the total system. It was very easy to spend time studying the laundry only to find that the real 'bottle neck' was elsewhere. The main considerations when examining a linen system were *standardisation* - to simplify laundry operations and distribution - *quantity and quality* - the system must be geared to the current needs of the user - *stock levels* - the minimum stock level must be established and *turnover time* - laundry throughput should be kept to a minimum. It was this last area where incentive schemes had the most impact.

Although it was possible to introduce an incentive scheme to a laundry without consideration of work organisation and methods, the maximum increase in productivity was achieved by careful examination of the sequence of operations to ascertain whether certain procedures could be eliminated, combined or simplified. Work place, layout and equipment should be examined to discover whether work flow could be improved and handling reduced by re-positioning equipment. Consideration should also be given as to whether operations could be made less laborious by appropriate training, eg by investigating the possibility of increasing calender output by improving feeding techniques.

The objectives of most laundry incentive schemes were to 1 increase operator productivity 2 speed the flow of work or reduce turnover time 3 reduce unit costs 4 attract and retain skilled staff in a competitive market and 5 provide management with control information on performance, output and costs and identify areas where production was lost. Since the Hospital Service spent approximately £20m on laundry services of which some 60% was labour costs, careful consideration of productivity was important. To examine the effects of introducing incentive schemes, Mr Clark examined two schemes introduced at different laundries.

Example 1

Small laundry serving approximately 1,300 psychiatric beds with old machinery

	Ref.Period	Target	Actual (3 month average)
No. staff (wte)	27.4	19.0	20.4
Labour cost	£34,500 pa	£30,050	£34,000
Production (pieces)	40,000	40,000	44,000
Operator prod. (p/wk)	1,460	2,100	2,160
Overall performance	66	90	98
Bonus %	-	20%	31%
Unit cost lab.	£1.66	£1.46	£1.48

Production up	10%
Unit costs reduced by	11%
Operator productivity up	49%
Earnings up	15%

This laundry serviced a psychiatric group with approximately 1,300 beds. Although the level of productivity was above average for this type of laundry, the figures were distorted by a large element of patient labour and a relatively poor specification of finish. After consideration of methods and the withdrawal of patient labour an incentive scheme was implemented. The objective of the scheme was to retain the present output with reduced labour costs but increase the take home pay of skilled operatives to ensure that they were retained. Also careful consideration was given to the standards of finish achieved and long term objectives were set to improve the qualities of finish within the limitation of the plant and equipment.

Example 2

Large, modern central laundry

	(3 laundries) Ref. Period	Target	Actual (3 month average)
No. staff (wte)	109.0	77.5	75.0
Labour cost	£152,000	£125,000	£122,000
Prod. (pieces/week)	150,000	166,000	138,000
Operator productivity	1380	2150	1840
Overall performance	56	88	90
Bonus % (average)	-	17.3%	20%
Unit cost labour	£1.95	£1.46	£1.27

Unit costs reduced	35%
Demand reduced by	8%
Operator productivity up	34%

This involved the closure of two additional laundries producing approximately 60,000 pieces and employing a total of 32 staff at a cost of £24,000. The incentive scheme was introduced with a target performance of 90, which would pay a 20% bonus to the staff involved.

Mr Clark indicated that results showed that, by careful attention to the organisation of the total linen system and to quality standards, it was possible to increase productivity, reduce costs and retain skilled labour. However the maximum use of laundries resources must always be subordinate to the primary objective of maintaining adequate supplies of linen.

MR A G WELSTEAD, Group Secretary and Treasurer, Edinburgh Royal Victoria and Associated Hospitals, discussed the development of hospital central linen services. He indicated that greater use of linen, rises in wages and salaries, shortage of staff and need to replace old equipment with expensive modern equipment had led to the need for higher standards of production, a reduction in labour costs and a finish to the non-productive labour processes such as checking and counter-checking. This led to the introduction of laundry linen pools which were not successful and hospital linen pools which were the fore-runners of central linen services. The development of these services were greatly welcomed by laundries because they lessened the work in the laundry of checking dirty linen and sorting and checking out of clean linen to wards. They also improved the flow of work through laundries and placed a 'buffer' between the ward units and the laundry.

Before a central linen service was set up there was the need to establish 1 the total amount of linen in circulation in the wards and departments 2 the daily usage of linen by wards and departments and the level of use which should be acceptable 3 standardisation of items, wherever this was possible in order to achieve maximum variety reduction 4 space and equipment required for the service and its relationship to each hospital 5 the best type of service for each hospital 6 the best method of achieving a good flow and control of dirty, foul and infected linen to the laundry and achieving the best flow back and 7 means of monitoring the system both for performance and to assess losses.

Once the system had been started it was essential to have some initial flexibility to meet crises and here the main requirement would be an injection of additional supplies of linen at different points where shortages had occurred. These should only be temporary and be withdrawn as soon as possible. If the initial study work had been well done the early alarms and excursions should be smoothed out by finding where faults had occurred in the system and ensuring that the flow of dirty and clean linen was corrected.

Complaints would inevitably come both from the laundry and from wards but these could normally be satisfied if the flow of linen was not held up at any point. This was an aspect to which particular attention had to continue to be given if the scheme were to run successfully.

In conclusion Mr Welstead considered that the following points should be given particular emphasis 1 the need to educate all staff involved 2 unrealistic estimates of needs must be corrected both up and down 3 adjustments for proved deficiencies must be allowed after reasonable trial 4 changed use of wards must take linen use into account 5 co-ordination of movement must be maintained at all points 6 weekend problems must be faced at the outset - the five day working week did

to monitor the adequacy and standard of service given to the hospital and to question the laundry manager if this was not satisfactory. The laundry manager should be provided with periodical statements by the Finance Officer comparing his level of expenditure with the proportionate part of his financial allocation and be prepared to investigate with him any serious deviations.

Although it was necessary to record expenditure, this did not indicate levels of efficiency or value being given for the money spent. It was necessary to relate some identifiable activity of the laundry process to the expenditure incurred and express this as a unit which could be compared year by year for the same hospital laundry as well as with other laundries. It would be possible to employ fairly complicated costing to laundries but this would demand a high level of recording and clerical work. Consideration had been given from time to time to using weight as a unit cost and also to a method of weighting of different articles, but it had been generally agreed that costing should be based on 100 articles laundered.

The laundry trading account showed the staff costs account for between 60 - 70% of the total expenditure. This emphasised the need for accurate up-to-date and meaningful personnel information. Although there was as yet no accepted method devised to provide the level of staffing required to carry out defined workloads in laundries, it was necessary to attempt to determine the need for staff in the organisation by fixing establishments on reliable data. If the various parts of the service had widely varying ideas of the standard that should be applied in determining staff establishments then this would impede the Health Board's function of promoting as far as practicable a fair distribution of the available staff over the area and allocating finance to those places where it was needed most. Given the requisite establishment the laundry manager required the backing of a strong personnel section at local level. Information produced probably as a by-product of the payroll should reveal any staffing difficulties which required attention and prompt action as appropriate. The flow of information must however be two way. Information was required of the laundry activity to satisfy public accountability, to convince the various levels of management that the organisation was efficient and to provide data for assessing the running costs of new developments as they came into operation. On the other side information must be provided to the laundry manager at frequent intervals to assist him in carrying out his role as a responsible spender and manager.

Financial control was concerned not only with accuracy and security but also with economy and efficiency. Boards had a statutory responsibility to institute adequate systems of financial control and the laundry in this respect was no exception. From 1964 maintenance of inventories of linen had been discontinued mainly because of the work falling on nurses in handling linen returns from the laundry and in maintaining linen inventories. Clearly the relaxation of control imposed an obligation on hospital authorities to ensure that as a result losses did not increase. This necessitated a much closer examination of expenditure trends on bedding and linen and in particular requests for substantial supplementation of linen supplies concentrated in the central linen pool.

As far as security and financial control were concerned again one was faced with striking a balance. Ward and departmental indenting took up a considerable amount of time and, if carried out by nurses, might interrupt clinical duties. It was extremely important, however, where a pre-arranged stock level at the consumer point was regularly replenished

without written demands under a topping-up system, that the stock level was regularly reviewed. It was important too that the level of replenishment was watched to ensure that heavy losses were not being incurred.

In conclusion Mr Alcock indicated that it was necessary at all times to remember that systems of internal check accountability and security were adequate and for the future the district financial organisation should provide a better service to the various departmental heads and managers of the service.

DISCUSSION

In the course of the discussion sessions the following were the main points to emerge:-

1 Personal clothing

Particularly with regard to long-stay units, the importance of providing personal clothing and a satisfactory means of their cleaning was stressed. To maintain a sense of personal dignity and a domestic atmosphere within these units non-standard issue clothes of good quality were most desirable for long-stay patients with a satisfactory supporting personal service provided from outside the wards. In many instances however and often due to lack of finance at laundry level, a personal service was not available and too often it became one of the functions of nursing staff at ward and departmental level to undertake the task of cleaning the patients' personal clothing. It was suggested that the large central laundry should in fact deal only with flat work for which it had been specifically designed and that personal clothing should be handled elsewhere in the hospital although not at ward level. Ideally a well organised 'mini'-service dealing with such things as personal clothing should be available to supplement the main service provided at the central laundry. The installation of washing machines at ward level to deal with personal wash was not desirable except where their use formed part of the activities relating to aids for daily living.

2 Communications and quality of service

The quality of service provided by hospital laundries was one of the most common targets of criticism by users. Fragmentation of service was one factor which led to poor communications developing between the laundry and hospital departments and the development of a totally integrated laundry/linen service with one organisational head - the laundry manager - would go a large way to improving an understanding of the difficulties which could be encountered in providing the service. There was a need for close liaison between the various staff concerned - laundry, nursing and administrative - to air each others problems and to establish such matters as acceptable standards. Quality of service was clearly allied to cost and although for instance a slow-down in machine running would undoubtedly improve levels of finish, cycle times would increase involving greater cost per article. On the other hand cost increases might in the future prove inevitable to maintain and improve standards since the average cost of 2.5p per hospital laundered item was considered by some to be artificially low.

3 Exchange trolley systems

The relative values of exchange trolley systems were discussed. Some English and Scottish experience of their operation had been unfavourable mainly in relation to transport difficulties but, although there was a costly initial capital investment, it was felt that a new district general hospital with an associated laundry not too distant was an ideal situation for such a system. This was particularly true when the system was designed at the planning stage with no requirement for ward linen storage.

4 Maintenance of service

Although the establishment of central laundry services was an ideal exercise for work study, it was suggested that the introduction of incentive bonus schemes did in some situations appear to affect adversely the service provided. The definition of standards of service required was important and, where this was satisfactorily established, it was stated that incentive schemes worked satisfactorily. With the increase of individual work activity however staff sickness levels did on occasion present problems at laundries most of which ran to tight schedules and this could lead to a reduction in quality of work. Difficulties in the recruitment of staff of the right quality also increased problems of maintenance of service and the working of a laundry on a 7-day basis to sustain turnover was not for various reasons, including maintenance of plant, a practical proposition.

5 Costing

It was noted that although the annual publication "Analysis of running costs of Scottish hospitals" published for SHHD could usefully be regarded as a pointer to look at certain areas of activity, some difficulties were experienced in the interpretation of laundry costs. Production per operator on duty, ie not including van drivers or those on sick leave, would be a valuable costing unit and identifying disposables and linen replacements separately would make the figures more realistic. There were many factors involved varying between laundries including labour catchment areas, product mix, types of machines and maintenance, use of disposables and quality of service and it was suggested that a more satisfactory comparison could be made by assessing each laundry individually taking these different factors into account. There were usually good reasons for apparently high costs in certain laundries and straightforward comparisons often did not give a fair assessment of the situation. Under re-organisation of the Health Service it would be an important function of the District Finance Officer to provide up-to-date financial information for the managers of individual services.

6 Range and design of fabrics

More consideration might be given in liaison with manufacturers to the range of materials and the design of clothes which were suitable for processing in hospital laundries. Rigid standardisation of patients' garments was not of itself acceptable for long-stay units, but it might be possible with the wide variety of fabrics being manufactured to select those types and certain basic designs which appeared particularly suitable for the hospital situation while at the same time retaining sufficient variety to avoid establishing an institutional type environment.

7 Monitoring

Although from a management viewpoint it was generally agreed that the laundry manager should be responsible for the running of the total laundry service, the administrator - usually the hospital secretary - had an important role in monitoring the service provided and in ensuring that effective lines of communication were established between the various categories of hospital staff involved. The use of ward housekeepers to relieve nursing staff of certain functions was also seen to have advantages in improving the organisational pattern and control at ward level and, although it was felt that it was very difficult to establish quantities of linen losses, an effective monitoring system - possibly even by staff appointed for this sole purpose - went a considerable way to identifying points where the service was most vulnerable.

Scottish Hospital Centre
November 1973

Fire in health buildings

Meetings at the Scottish Hospital Centre on 6 December 1973 and 11 January 1974.

This report covers two conferences held in conjunction with an exhibition at the Centre to review different aspects of fire in relation to Health Service buildings. In opening the exhibition and the first session, Mr. Enoch Humphries, National President of the Fire Brigades Union and Member of the Western Regional Hospital Board recalled a number of recent major fires in public buildings and emphasised the considerable losses involved. He stressed the importance of training all levels of staff as to the correct procedures to be adopted in the event of a fire outbreak and for the need to provide efficient equipment for use in the prevention, detection and fighting of fire.

Detection and Prevention

MR R P FRASER, Secretary of the Scottish Home and Health Department and Chairman of the Council of Management of the Scottish Hospital Centre took the Chair.

Engineering aspects

MR R P TARKENTER, Engineer, Scottish Development Department noted that the regulations produced by the Institution of Electrical Engineers formed a fundamental part of electrical safety and fire prevention in buildings and were backed up by a large number of British Standard Specifications and Codes of Practice. The Buildings Standards (Scotland) 1971, which included the IEE Regulations, were mandatory in Scotland. Otherwise the Regulations carried no statutory powers and were only a guide to good practice. They did not attempt to form a specification or take account of every possible circumstance but identified areas and situations requiring special consideration with regard to safety.

Despite all the regulations and fire precautions, fires caused by electrical equipment and cables continued to rise. In 1970 of some 39,000 fires in commercial buildings, 7,500 were caused by electrical cable or equipment. In relation to hospitals, during 1968 a sample of hospital fires had shown that of 680 fires, 140 were attributed to electrical cables or equipment. A large proportion of fires were basically due to carelessness and misuse of equipment and this applied equally to portable and fixed appliances and to the correct installation and connection of equipment. It was likely that a large percentage of these was caused by high resistance joints or partly severed cables causing local overheating.

It was clear that the fire alarm installation itself must not be a contributory factor in the cause of fire and, once the fire had started, the system must remain in operation in the vicinity of the fire for as long as possible. It would help if the fire alarm cabling could be separated from the normal service runs but in a modern hospital this was not easily achieved. Service ducts were provided rising through cupboards and above false ceilings and contained heating pipes, gas pipes and cables of all descriptions. If a fire were to start in a service duct it was possible that alarm systems could be put out of action before the fire became apparant, although some measure of protection for PVC cables was possible by coating them with an intumescent paint. Mineral insulated cables were also used very frequently for fire alarm systems. These could withstand very high temperatures without failing but careful consideration had to be given on these installations to the joint boxes.

The problems of maintaining good electrical contact had been evident for many years but, with the introduction of aluminium and untinned copper cables, the difficulties were increased due to problems of oxidisation. The Electrical Research Establishment had shown that the incidence of fire increased with the age of the installation and there was evidence to show that immediate post-war installations were more prone to fire incidents than pre-war installations of the same age.

Engineers were sometimes considered to be over-cautious when seeking to carry out repairs or renewals on installations that had not given trouble and appeared to be satisfactory. Installations such as these were not uncommon and were susceptible to mechanical damage or a transient overvoltage which could lead to rapid failure. There was a danger when budgeting for maintenance funds to keep deferring rewiring schemes because of other priorities.

The fire alarm installation was the key in any fire precaution system and Hospital Technical Memorandum No. 16 indicated that the basic desirable requirements for fire alarms in hospitals were that no occupant should have to walk more than 100 ft to reach a call point and audible warning should be given to a central control and other appropriate locations with visual indication of the location of the fire call. Also facilities should be provided at the control station for passing fire alarm calls to the Fire Brigade and initiating the alarm procedure. Automatic relaying of the call to the Fire Brigade was desirable and automatic circuit fault indication with audible warning and supply failure alarms together with simple test facilities should be provided.

The alarm call points might be of the break-glass or key operated types or the internal telephone system might be used providing certain requirements were met. Arguments could be put for each system and if the telephone system was used, a significant cost saving could be shown.

Conventional systems could be grouped under broad headings of open circuit or closed circuit. Both systems could be monitored and a warning given in case of circuit failure. The normal practice was to sub-divide the system into a number of clearly defined zones,

their size depending on the general nature and layout of the building. Most hospital buildings fell into the multi-zone category with each zone forming a separate fire compartment. For the small to medium sized installation, the standard break-glass contact, bell and indication board system perhaps backed up by some form of automatic detection equipment and magnetic door switches would be acceptable. But with regard to the large hospital complex it was not unusual to find a central communication control system and some form of supervisory and control centre for boiler plant, heating, refrigeration, ventilation and medical gases. The next logical step was to combine the fire alarm system with this central control, thus allowing all the engineering services to be monitored from one position. Computer controlled equipment was also now available for installation in fire stations that could hold in its memory bank complete floor layouts showing escape routes, positions of smoke stop doors, hose reels etc. and any other relevant information about the building, occupation or contents.

For most fires the largest hazard to life came from the smoke and fumes produced. Although an air conditioning or ventilating system might be a potential means of spreading fire and smoke, conversely the design of a system could be such that it might be used beneficially to control smoke from fires. Where it was required to prevent the spread of fire through a compartment wall, floor or protected shaft, fire dampers operated by fusible links or other sensing devices could be installed. In common with other safety equipment, however, fire dampers had to remain effective after many years often in inaccessible places and in conditions not conducive to ease of maintenance.

Fire protection in relation to ventilating and pressurising large covered areas.

MR W BLACKWOOD, Consulting Engineer, Ian Hunter and Partners, spoke on the control of smoke and toxic gases produced by the combustion of materials and methods of avoiding the spread of these gases into escape routes such as corridors, lobbies, stairwells, etc.

Smoke logging, as it was termed, could take place very rapidly and produce serious problems in regard to hindering escape, endangering lives and restricting and possibly even preventing fire fighting. Hospital buildings presented very special problems. The development of district general and teaching hospitals did, by their nature, greatly magnify the difficulties and no clear picture had emerged as to how buildings should be designed in relation to smoke control. The principle of pressurising stairwells and lift lobbies was already well established and there were a number of buildings in the UK where installations had been tested. Since the results suggested that an efficient answer had been found, it was possible that this idea could be applied to hospital corridors.

The four main influences on air movement within a building were (1) stack effect (2) wind (3) fire and (4) mechanical ventilation.

(1) Stack effect - since air density lessened with temperature increase, the temperature difference, in winter particularly, between inside and out produced air movement within the buildings, principally in vertical shafts, ie lifts and stairwells. The direction of air movement might well be contrary to that required and therefore the design must take this into account. Stack effect was particularly important on high buildings whereas corridors were relatively insensitive to it but were more affected by wind.

(2) Wind - the pressure distribution on the face of a building depended on many factors; topography, direction of wind, shape and height of buildings. Prediction of the effect on the building could be made more accurately using models and increasingly this was being done on larger developments. The result of this pressure could be to produce internal air movement horizontally and also vertically. Generally for buildings higher than 90 metres, wind might be ignored except where stairwells were divided into 8 storey sections.

(3) Fire produced rapid temperature and pressure increases to the air in the vicinity of the outbreak. These in turn caused smoke to emit from the top gap of a door while cool air entered the room via the bottom gap.

(4) Mechanical ventilation - the effect that the mechanical ventilation could have on internal air movement was well known. Systems could however produce equitable conditions to work and live in and the current practice of supplying more air than was exhausted assisted in limiting the effect of wind and stack.

To pressurise a particular zone in a building to a specified level by means of mechanical ventilation, the rate of air input was determined by the resistance of the leakage paths, ie door and window gaps, building joints, etc. A pressurisation system therefore relied on proper control of the fit of these building elements particularly during construction.

Since the fresh air supplied for pressurising must be vented to maintain internal air movement patterns, exhaust vents must be included in the design. Methods of venting included window leakage, mechanical and natural vent systems. All required careful consideration since weather stripped doors could provide insufficient crackage on their own. Where a ducted system was employed, heat and smoke dampers usually fitted at fire boundaries must be omitted lest they isolated the vented area; this arrangement was contrary to present regulations.

In conclusion Mr Blackwood considered that more research was required before clearly defined design procedures could be drawn up. Ideally since mechanical ventilation was required in many internal areas in any event including corridors, lift lobbies etc. it was extremely tempting to employ that same system for pressurisation. Suggestions as to reducing the pressure levels during every-day operations already existed. However, plant reliability, stand-by and emergency considerations operating schedules, hardware limitations, additional air isolating features (for accommodation) and control aspects needed to be taken into account but it was likely that very shortly an economic and practical solution to these difficulties would be found and the pressurisation and environmental system would be combined in many instances.

Equipment

MR I MACDONALD, Scottish Area Sales Manager, AFA-Minerva Ltd, gave a description of the range of equipment available for use in fire prevention and detection and which was currently on display at an exhibition at the Scottish Hospital Centre. He discussed briefly the problems associated with fire prevention and stressed the importance of training staff in good housekeeping and safety requirements regarding the location of flammable liquids. The history of detection techniques was traced concerning heat, smoke, combustion gas (ionization), infra red and ultra violet detection.

Ancillary equipment associated with detection was explained covering magnetic door release units, manual break-glass units and audible and visual warning devices. Standards required to obtain a satisfactory and trouble-free system with respect to equipment and electric wiring were of considerable importance and, in relation to engineering, parameters were mentioned which included comment on the limitations of each type of detector and the problems associated with incorrect siting. Fire brigade communications were outlined giving the systems available, ie Home Office Signalling; VF System A; Central station signalling (Commercial); 999 Telephone Alarm and Satellite Signalling System (proposed)

Comprehensive fire precautions - obligations of occupiers

MR A TAIT, Senior Fire Prevention Officer, South-Eastern Fire Brigade, noted that the Fire Precautions Act, 1971, had been brought in to make further provision for the protection of persons from fire risks and for related purposes. Section 1 listed classes of use for which a Fire Certificate was compulsory:-

1 for any purpose involving the provision of sleeping accommodation

2 as or as part of an institution providing treatment or care

3 for purposes of entertainment, recreation or instruction or for purposes of any club, society or association

4 for purposes of teaching, training or research

5 for any purposes involving access to the premises by members of the public whether by payment or otherwise.

To date only one Designating Order - the Fire Precautions Hotel and Boarding Houses (Scotland) Order 1972 - had been made. The proprietors of hotels and boarding houses which came within the scope of the Order had to make application to the Fire Authority for a Fire Certificate. The application was made on the appropriate form and the relevant property had to be visited by the appropriate officer appointed by the Fire Authority who after full assessment of the situation would then issue a Fire Certificate. In making this assessment the Authority had to be satisfied with:-

(a) the means of escape in case of fire with which the premises were provided

(b) the means, other than the means for fighting fire, which was provided for securing that the means of escape could be safely and effectively used at all material times

(c) the means for fighting fire, whether in the premises or affecting the means of escape, for use in case of fire by persons in the building and

(d) the means for giving to persons in the premises warning in case of fire were such as might reasonably be required in the circumstances.

Where the Authority were not so satisfied, they were required to serve a notice on the applicant informing him of the steps which would have to be taken to satisfy the requirements. The Fire Authority must also consult the appropriate Building Authority if structural alterations were to be carried out. Although no policy had yet been laid down with regard to hospitals it was likely that a similar procedure initially would be adopted. Hospitals being Crown property however, the application would require to be sent to H M Fire Inspectorate although some responsibility in the matter could be delegated to the appropriate Fire Authority.

The contents of a Fire Certificate were specified in the Act which stipulated that every Certificate issued with respect of any premises should specify:-

(a) the particular use, or uses, of the premises which the Certificate covered

(b) the means of escape in case of fire

(c) the means, other than those for fighting fire, for securing that the means of escape could be safely and effectively used at all material times

(d) the type, number and location of the means for fighting fire whether in the premises or affecting the means of escape for use in case of fire by persons in the building

(e) the type, number and location of the means for giving to persons in the premises warning in case of fire.

The Fire Inspectorate or Fire Authority might, however, impose any requirement which was considered appropriate in the circumstances. For instance (a) for securing that the means of escape in case of fire were properly maintained and kept free from obstruction (b) for securing that the means were properly maintained (c) for securing that persons employed to work in the premises received appropriate instruction or training in what to do in case of fire and that records were kept of instruction or training given for that purpose (d) for limiting the number of persons who might be in the premises at any one time and (e) as to other precautions to be observed in relation to the risk in case of fire to persons in the premises.

Considerable thought had been given to the standard type of certificate and many Authorities had produced their own version on approximately the same lines as the certificate issued by the Home Office. Although it was uncertain whether this form of Certificate would be used for hospital premises when they were designated, it might be that a similar document would be devised.

II

Evacuation and Design

MR E W M WATT, Secretary of the Board of Management for Inverness Hospitals and Member of the Council of Management of the Scottish Hospital Centre took the Chair.

MR T D W ASTORGA, Regional Architect, Western Regional Hospital Board, noted that in hospital developments it was necessary to design and construct buildings to minimise the spread of fire and to facilitate the movement of people to places of safety should a fire occur. Protection against fire was of the highest importance and must be considered at the earliest possible stages of design so that requirements could be embodied in the scheme from the outset.

There was a considerable amount of guidance material, together with various Acts and Regulations to which the building plan must conform. These included the Scottish Building Regulations, Offices, Shops and Railway Premises Act and Design Note No 2 issued by DHSS together with various Hospital Technical Memoranda including in particular No. 16. In addition the advice of Firemasters through their Fire Prevention Officer must be sought concerning means of escape and other fire precautionary measures required within the building.

Hospital Design Note No 2 - "Protection against fire" - made an examination of the hazards of fires in hospital buildings and recommended particular techniques to deal with them particularly in relation to compartmentation. This meant the physical division of the building in to fire-tight compartments enabling the evacuation of staff and patients to be phased in the case of an emergency. The first phase would be the movement of patients and staff from the compartment in which the fire originated into an adjacent compartment allowing the fire affected area to be sealed off. Only if the fire outbreak could not be brought under control within the compartment in which it originated would the second stage of escape by way of the staircases to another compartment, be necessary.

The third phase would be the evacuation of the building and the moving of people outwith the structure. Should stages 2 and 3 become necessary, the gain in time due to the existence of compartments would reduce the urgency with which these more difficult stages need be undertaken. If the Fire Brigade was called promptly and the compartment in which the fire originated was quickly evacuated and closed, the second phase of evacuation might not be necessary. In planning, therefore, emphasis must be laid on ensuring that the first stage of evacuation could always be carried out effectively and safely and the remaining stages could be achieved if essential to do so.

Design Note No. 2 did not replace the Scottish Building Regulations, although, in general, the demands laid down in the Design Notes were actually higher than required by the Regulations. The Note divided hospital into four main categories in relation to compartments and sub-compartments:-

(a) areas of high fire risk or high fire load included laboratories, main kitchens, laundries, boiler houses, works departments and main stores.

(b) areas of high life risk, eg wards, must form separate compartments over all other parts of the building. Wards should be planned so that all staff and patients within a ward compartment were able to move horizontally over compartments or sub-compartments using the staircases to escape to the open air if absolutely necessary.

(c) remaining parts of the hospital only required compartmentation over 15,000 sq ft.

(d) communication areas - it was essential to keep the stairways passable in order to facilitate Fire Brigade access during an outbreak of fire and to provide vertical means of escape for patients and staff from the building; and as lifts could not be relied upon as a means of evacuation in case of fire, staircases must form separate compartments in order to prevent fire and smoke from entering.

No multi-storey hospital should have less than two staircases and at no time must the escape route to staircases exceed 100 ft in distance in one, two or more directions, and the maximum travel distance from a dead-end to a staircase must not exceed 40 ft. It was therefore advisable to have staircases at the end of blocks but, where this was not possible, only ambulant patients should be accommodated in "dead-end" areas.

Two points highlighted in the Scottish Building Regulations concerning staircases were vital to note - Regulation 50 stated that staircases should be separated from the remainder of the building by a fire-division wall and No. 51 stated that where the building height was more than 80 ft the stairs should have a lobby access, the lobby to be naturally vented to the open air. All lobbies and landings should be adjacent for easy handling of patients on stretchers or on mattresses, and in all cases stairs should discharge at ground level directly to the open air, or into separate compartments, or to the open air via a protected corridor. A staircase should never continue straight down to the basement as it could cause a grave risk to life where visibility might be impaired due to smoke and patients and staff escaping via the staircase could enter an area of no escape and be trapped.

Lifts wherever possible should be grouped in such a way that the lift system formed a separate fire resistant enclosure, protected at each floor level with fire check doors to all lift openings. Service ducts formed a possible path whereby fire might spread from one compartment to another and consequently it was essential to ensure that they were compartmented and all access doors to ducts within the building should be tight fitting. Roof voids must also be carefully considered and where ceilings did not have adequate fire resistance, walls from the compartment must be carried up through any roof void and any openings in these walls should be fitted with doors of adequate fire resistance.

critical the assessment an element of risk was still to be borne. Self-care accommodation should be fitted with smoke sensory units which could warn the occupants and staff elsewhere in the event of fire. Like so many other things however, they were on a list competing for the limited finance available.

Although there was little problem in relation to young nurses on night duty since their experience was limited by the GNC and they worked under the supervision of qualified nurses, problems usually related to staff recruited directly to night duty without previous training or experience. In this connection, induction courses were helpful but supervision was required until they appeared competent and felt confident. Shortage of staff frequently left nurses working alone when ideally they should still be under supervision, but it was to the credit of senior nursing staff that they allocated staff as well as they did in trying conditions. A similar problem lay in the number of staff who gravitated to night duty for personal or domestic reasons which could reduce their efficiency. Although hospitals frequently stated a minimum number of nights for which part-time staff would be accepted, it was probably better to accept the administrative inconvenience of staff working one night weekly and know they were dependable than insist upon a three night minimum and the employment of over-committed night staff. Supervision became all-important and the maintenance of a high standard was dependent upon good personnel management.

It had been recommended that the night nurse should be provided with a duty room. The room with a sliding glass viewing panel would overlook the dormitory enabling the nurse to survey the ward and would include a telephone and facilities for light refreshment. Such rooms however, brought a false sense of security to the staff concerned since uninterrupted observation from any one point was now seldom possible due to compartmentation of ward units. By preference a portable night station in the form of a small desk table was all that was likely to be required. Comment had also been made that many doors were kept locked and it had been suggested that this was only really necessary where there were dangerous patients and to a lesser extent for wandering patients. Security officers should however, be concerned about the risks of pilfering and recommend that outer doors and windows should be locked at night. Allied to this was another problem highlighted in the Coldharbour report, the non-repair of buildings and equipment. Building supervisors and hospital engineers must give attention when delayed action followed a request for repairs by nurses. A simple system of acknowledgement to requests for repairs should be devised giving the reasons why repairs could not be executed within a short period with follow-up contact made at frequent intervals. Such a system helped mutual understanding and minimised risks.

Slowed reactions by patients, especially at night due to the use of sedatives, was also a problem. No doubt all drugs were prescribed from need but it could be challenged whether they were always reviewed critically and at regular intervals. Nurses should be more prepared to suggest that drugs be reduced for certain patients rather than only reporting those patients whose behaviour was different or disruptive and recommending sedation. Approved experimentation reducing drugs could lead to more active nights in some wards but, with revised patterns of patient care, it was often possible with nurse and doctor co-operating to minimise sedatives and still have patients sleep at night.

Problems were also created by the increasing number of psycho-geriatric patients being admitted to wards badly located and often ill equipped for their care and, since the installation of lifts to provide additional beds for the elderly in multi-storey buildings could lead to difficulties, a plea was made where practicable for more beds for the elderly to be made available at ground level.

The Fire Service view on evacuation and design

DIVISIONAL OFFICER T MILLER, Senior Fire Prevention Officer, Glasgow Fire Brigade, noted that recent fires in high rise buildings had indicated that present building concepts were not adequate. Only if ground floor buildings were to be provided would the problems of evacuation be eased to some extent. It was necessary to design, construct and occupy hospitals in such a way as to (1) reduce the possibility of a fire occurring at all (2) limit the spread of fire to a minimum and (3) make easy the movement of people to places of safety in the event of fire. A place of safety might in the first instance be a horizontal direction but, since total evacuation might become necessary, it could mean evacuation downwards. It was necessary to make use of compartmentation in order to separate high risk fire areas from ward areas, to divide up large areas into smaller units and to separate stairs and corridors forming escape routes from the remainder of the building. Adequate means of escape by stairs, ramps, open bridges and lifts should also be available and ventilation should be provided to extract as quickly as possible smoke and hot gases.

Layout

It was a first principle of every Fire Officer that highly flammable substances, high fire risk processes and high fire load areas should be kept as far away from stairs, corridors and exits as possible so that should a fire occur, persons were moving away from risk areas in making their escape. It was doubtful how often this principle was recognised in designing and occupying hospitals. Kitchens, records departments, shops, plant rooms, X-ray rooms, etc. were usually to be found on the basement, ground and in some cases first floors, with wards on the upper floors above. To obviate the risk of fire affecting an entire hospital, such areas should be on the top floors.

Should a fire occur in any of these risk areas, total evacuation of the wards above because of smoke logging became a distinct possibility and a very difficult task. It meant that evacuation had to be carried out down past the areas on fire, that rescuers must fight their way through fire areas to help with the evacuation and that evacuation must be carried out fast without undue heed to the nature of a persons incapacity. If the wards were beneath however, evacuation might not be necessary at all and, even if it was, it could be carried out in a more leisurely fashion with less upset to the patient and with a lesser distance to travel to ground level and safety.

Separate Buildings

Where extreme precautions were desirable consideration should be given to using several spatially separated buildings. Escape stairs could be constructed as separate units linked to the main building at each storey by ventilated or open bridges. Clearing a conventional hospital of bedfast patients in the event of fire was a time-consuming job because descent to the ground floor meant using either lifts, ramps or stairs. If a hospital were to consist of not one but several buildings joined at each level by open or ventilated bridges, no patient would have to change levels to be transferred from one building to another.

Stairs

Some sense of false security had been generated by the protection being built into the construction of stairs. Such features as lobby approaches, ventilated lobbies and fire resisting or fire check doors in practice did not provide total immunity from smoke. In order to function at all, doors must have gaps around them. All too often self-closing doors were held open by a wedge, self-closing devices became weak or faulty and did not properly close the door and doors had to be opened to allow persons to escape and permit firemen access. Wherever an opening occurred, however small or for however short a period, smoke would penetrate with frightening rapidity. Escape stairs should be constructed as separate units linked by ventilated bridges and it was desirable that further research should be carried out into the use of pressurisation of stairs as a method of preventing the entry of smoke.

Compartmentation

The success of compartmentation depended on the doors that were built into separating walls. Such self-closing doors must be maintained in the closed position or at least be fitted with electro-magnetic catches linked to smoke detectors if they were to be kept open. It was likely that this requirement would be written into the Building Regulations in the future.

Combustible materials

Although fire resisting construction was relied on, the problem of combustible contents in a building had not been solved. It was necessary to reduce to a minimum the amount of combustible materials introduced into buildings and to make sure that wall and ceiling linings were non-combustible in corridors, stairs, exit routes and wards and that they were of at least a Class I Surface spread of flame rating as defined in BS 476 in other sections of a hospital. In addition although the use of cellular plastics such as foamed polyurethane had many advantages as an insulating material and for bedding purposes, because of the large quantities of toxic fumes produced, substitutes, which were less dangerous, should be used wherever possible.

Lifts

Lifts were not designed as a safe means of evacuation and to date were not accepted by Fire Services as such. They were, however, used by Fire Service personnel during a fire and indeed it was often insisted that one at least was fitted with over-riding controls so that access to the scene of the fire could be achieved as easily as possible. It was a fact that lifts were a prime means of moving people between floors in high rise buildings and it was for consideration, if stair towers could be made smoke proof, why could not lift shafts. If total evacuation of a hospital became necessary it would be necessary to use every means of escape available.

Ramps

It was desirable that greater emphasis should be placed on the provision of ramps from the upper floors of hospitals although it was appreciated that there were design and structural problems involved. They should however, be considered as a means of getting non-ambulant patients down to ground level.

Fire alarms

If limited or total evacuation was to be carried out, there must be some means of giving warning to staff that a fire had broken out. It had been recommended that the use of telephones for this purpose should be used but this was not satisfactory. In offices, shops, factories and public buildings the glass fronted box was becoming more acceptable and was instantaneous in operation. In high fire risk areas and unoccupied parts of hospital automatic alarms should also be installed, preferably of the smoke detector type.

Access

In the modern concept of some hospitals ancillary units were spread out at ground level over a large area with the ward blocks rising up as a central core. In these circumstances the access for fire appliances was generally restricted to the perimeter. This might mean that, in the event of a fire, firemen must travel comparatively long distances to reach the source or carry out evacuation. If the fireman was to perform successful rescue operations or fire fighting duties, it was important that his energies were conserved for the essential work and not dissipated on unnecessary effort in reaching the fire. It therefore seemed obvious that it was advantageous to provide access for fire appliances as close to the high life risk areas as possible. Turntable ladders and hydraulic platforms were essential parts of the Fire Brigade's equipment and it was essential that the opportunity and facilities for using them should be given.

Training

It was essential that hospital staff should be trained in the action to take in the event of fire. This should cover senior to junior staff since it was important that everyone responsible knew exactly what was to be done in the event of fire before it took place. HTM 16 stated that "at conspicuous positions in all parts of hospital

buildings printed notices should be exhibited stating in concise terms the main essentials of the action to be taken upon discovering a fire and on hearing the alarm." It was essential however, that notices must not only be in conspicuous places but easily read. This equally applied to directional signs and route indicators both inside and outside the buildings.

There were many other features of design that had a bearing on evacuation:-

(1) there must be facilities for controlling plant and services easily and quickly

(2) there was a need for fire dampers in ducts which passed through fire division walls

(3) it was essential to ensure that all openings in walls around pipework, ducts and electrical services were efficiently sealed to prevent the passage of smoke

(4) there was a need for emergency lighting and this might be included in the Buildings Regulations in the near future.

(5) it was necessary for some methods of communication to be available between floors and ground level in high rise buildings and

(6) there was a need for good housekeeping practices to be adopted in all parts of hospitals.

The effect of fire precautions on design

MR J BEVERIDGE, Architect, Sir Basil Spence, Glover & Ferguson indicated that, although there was in existance a considerable amount of legislation controlling the design of buildings including hospitals, it was difficult to generalise about the effects of fire precautions on design. So much depended on the brief, the site and the design solution being sought. If the requirements of the fire precautions were borne in mind during the early stages of the design process in common with other planning requirements such as noise control, then the problem was simplified. Difficulties often did arise when the requirements were overlooked until an advanced stage in the design thinking had been reached.

When fire broke out in a building the immediate hazard was to the occupants. The degree of hazard to which they were exposed was largely influenced by how quickly the fire took hold which was in turn dependent on the materials used in the internal finishes and furnishings. The first essential therefore in the design and construction of the building was to ensure that the occupants could be got to a place of safety and to achieve this two main facts must be observed. Firstly adequate means of escape must be provided from all parts of the building and secondly the building must be so designed and constructed that the risk of smoke and fire spread was minimised.

The requirements for fire resistance of an external wall and extent of openings permitted in it depended on its position relative to the boundary. When fire developed within a building, heat was transmitted to other buildings in the immediate vicinity. Transmission could be by conduction through solid materials, or by convection, radiation or flying brands. As a design guide it was useful to consider the function that external walls should perform in the event of fire. The wall should confine fire within the building until it was controlled or had burnt itself out and should provide protection for fire fighting purposes. It should prevent entry of fire from an adjacent building and also prevent spread of fire from one storey to another. When positioning a building on a confined site it might be necessary to provide division walls and compartment floors with the sole purpose of reducing the area of elevation which in the event of fire might be assumed to be radiating heat. The smaller the division or compartment the nearer the building could be located to the boundary. Recommendations for protection against fire spread from one storey to another were given in Hospital Design Note No 2.

The regulation did not require resistance to a fire within the building in the design of the roof construction. Control was, however, exercised over roof construction as far as external exposure was concerned, ie where the roof was subjected to radiated or convected heat or from flying burning brands from a fire in an adjacent building. The roof construction as a whole should be capable of resisting the penetration of fire into the building for a limited period. As a general rule fire protection measures for the roof should be taken with a view to ensuring that materials used in construction should contribute as little as possible to the general spread of fire both internally and externally.

Provision must be made when siting the building and in the design of site layout to give adequate facilities for fire service access. The principal operational purposes of the fire services with which the regulations were concerned were firstly to extinguish fires in buildings quickly and secondly the rescue of people who might be cut off by fire or smoke or otherwise prevented from using all normal escape routes. Access must also be provided for in any enclosure fencing. In addition to the site access, facilities access also had to be provided to the interior of the building particularly where it was impossible to fight the fire from outside. The regulations went a long way in making provision for protected access to upper floors by the requirements for staircase enclosures and ventilated lobbies which cut off the stairway from the remainder of the floor.

The internal planning of the building was to some degree influenced by requirements for compartmentation and provision of escape stairways related to the travel distance requirements within these compartments. Compartmentation provided the basic means of fire protection whereby within the building any outbreak of fire which occurred could be isolated. In some types of buildings, however, compartmentation requirements could create internal planning problems although this was less of a problem in a hospital where functional planning requirements tended to dictate that the space was sub-divided into a number of smaller units. Sometimes conflicts did arise however, between fire requirements for escape doors and security requirements within the hospital. The area of each compartment was limited by regulations.

Hospital Design Note 2 recommended that the area was restricted to a maximum of 15,000 sq ft but, because of the nature and risk in hospitals, a further breakdown into sub-compartments was recommended. These sub-compartments were considered to function in a similar manner to the main compartment. If the compartmentation was constructed to the regulation requirements it was unlikely that fire would spread rapidly into an adjoining compartment or sub-compartment. It might be assumed, therefore, that once a person had passed through a protected opening in a fire division wall he was in a place of safety always providing that if the situation worsened it was possible to get to the second stage escape route, staircase, and eventually to the open air. The planning and design of the escape route was also very important and, once the line of escape had been defined, the exit width had to be calculated.

In hospitals the design of escape stairs was extremely important. These must be designed to permit unhampered passage of stretcher-borne patients and adequate space must be allowed for turning especially on landings. The stairway must always be enclosed and form a separate compartment in order to prevent spread of fire or smoke into the stair. The flights should be separated by landings and the length of landing should not be less than the width of the staircase. The staircase must also change direction of flights at each landing.

In relation to lifts the plan arrangement should be such that the lift system formed a separate fire resistant enclosure with the openings protected at each level with fire check doors. In multi-storey buildings of more than five storeys at least one fire lift should be provided.

Fire could spread within a building through service ducts. The regulations require that they should be compartmented and should be of a fire resisting construction with a grade at least equivalent to that of the structural elements bounding the duct. Access doors and panels to ducts must also be similarly protected.

Too often door assemblies were under-rated in importance in the fire protection of buildings. A door assembly capable of maintaining its integrity for 20 minutes and being free from collapse during a fire resistance test of 30 minutes, could be considered to have achieved the highest fire check standard. The design of the door frame and selection of ironmongery, including type of door closer was something which also required careful consideration.

In relation to suspended ceilings these could be used for a variety of purposes some functional, eg acoustics, lighting, concealing services, or could be purely decorative. From a fire protection aspect only two types had to be considered - those that provided part of the fire resistance of the structural floor or its supporting members and those that provided no protection at all. Whatever type was used the capacity of the compartment should be calculated to extend to the structural slab and not to the suspended ceiling. Suspended ceilings which did not contribute to the fire protection must not add to the fire hazard and in the design of ceilings of this type the aim should be to reduce the combustible content of the ceiling void to a minimum.

It was important to emphasise that elements of construction which had been designed for fire protection purposes should be properly carried out to the design details. The architect might specify a particular material or constructional detail on the basis of a manufacturer's fire test results. If these items were not installed as supplied to the manufacturer's instructions or as detailed and some site modification was made, this could lower the fire resistance. This particularly affected partitions, suspended ceilings, door assemblies and glazed screens which were all readily susceptible to on-site modifications and the only answer was careful site supervision and a full appreciation and understanding of the aims of fire protection. The Building Regulations did not cover all the circumstances which were likely to arise but, if one kept in mind the spirit of the regulations and applied the basic requirements in a common sense way, a satisfactory answer could normally be found. One problem however, which was not covered by the regulations was the large building complex. In the design of some of the more recent hospital developments in Scotland the concept of a large podium area at ground floor and basement levels with tower blocks rising above had been introduced. Developments of this nature were entirely outwith the scope of the present Building Regulations and tended to present a new set of problems with regard to fire protection, fire fighting and means of escape. At the present time in Scotland these large complexes were dealt with by means of relaxations but further legislation would have to be introduced to deal with such developments.

MR D JACK, Engineer, Donald Smith, Seymour & Rooley, mentioned that due mainly to the increase in size and complexity of buildings, increased sophistication of services and awareness of fire hazards, engineering services installations associated with fire at present represented a considerable percentage of the overall installation and a considerable financial commitment.

The problems faced by the services engineer could be grouped under 4 headings - (1) prevention of fire; (2) detection and indication of presence of fire; (3) provision of protected areas and (4) provision of engineering systems to assist fire fighting.

(1) Prevention of fire

The main danger from fire lay not in the flame or heat but in the toxic fumes or smoke generated from the material which was heated. Engineering installations were constructed from a wide variety of materials and, particularly in the field of thermal and acoustic installation, foamed polystyrene, polyurethane and rubber compounds, cork sheets and hair felt had been found to be the most efficient and most economic materials. In addition large quantities of PVC sheet were used to construct duct work, to handle corrosive gases and to provide moisture-proof cladding to air conditioning ducts and pipe work. However, since these materials generated large quantities of toxic gases and smoke when burnt or smouldered, it had become necessary to abandon them and substitute mineral wool fibreglass mattress and boards which were quite effective for insulating purposes. Problems did remain, however, with respect to deep freeze and cold storage rooms and temperature control rooms.

(2) Detection of fire

A considerable diversity of opinion existed as to where fire detectors should be fitted, although it was generally accepted that areas, which were not occupied for 24 hours per day, or wards where supervision was not continuous should have such detectors. Many would argue that detectors were not necessary in circulating areas and corridors but Fire Prevention Officers frequently sought to locate them in these situations. When fitting automatic detectors it was normal practice to arrange the building complex into a number of areas each area divided into specific zones. At the Fire Brigade entrance point to each area an annunciator board was fitted indicating the zone in which fire was present and an alarm was given to a central point from where the Brigade might be informed.

(3) Provision of protected areas

Relating to the compartmentation of buildings, while the service engineer could have little or no influence in the definition of the compartments, he must be closely involved with the architect at this stage of planning. The services installations should be designed to reduce as far as possible any penetration of compartment division walls. In mechanically ventilated buildings every effort should be made to ensure that the ventilation system was self contained within a particular compartment. However, main distribution ducts must necessarily pass from one compartment to another and the system should be arranged so that breaches in fire division walls were kept to a minimum. Where pipes or ducts passed through fire walls or floors it was necessary to provide barriers to fire and smoke, these barriers taking the form either of seals around pipes and ducts or dampers in ventilation ducts. It was essential that space around all pipes passing through floor or fire division wall should be plugged.

(4) Provision of engineering systems to assist fire fighting

Included in the building service installations were items specifically provided to assist with fire fighting the most important being (1) pressurised water distribution systems (2) automatic detection, alarm and plant control systems (3) fire lifts and (4) pressure ventilated staircases.

Water distribution systems for fire fighting might be hose reel type, dry riser or wet riser types or sprinklers. A dry riser system was essentially a pipe rising through the building with an inlet connection at the base to receive the Fire Brigade pumps. Outlet valves were provided at each floor to receive hoses and allowing for a speedy provision of water to any level. The wet riser system consisted of a water storage tank of not less than 10,000 gallons capacity with a pressurised ring main supplying wet risers to landing valves at each staircase landing and at various points throughout the building. The pressurising unit consisted of an electrically driven pump, diesel engine pump, pressure tank and automatic starting equipment. Sprinkler systems comprised a series of nozzles at ceiling level supplied with

pressurised water from a guaranteed supply. In the event of fire, heat opened the nozzles and allowed water to spray down over the affected area.

The mechanical services in buildings were normally controlled by local control panels located in various plant rooms throughout the building. This arrangement was quite satisfactory in buildings of reasonable size but in large units, particularly those with complex areas, an area might be served by a plant room some distance away and plant might be difficult to reach from outside the building.

Within each group of lifts provided to a building one should be designated as a fire lift. This lift should be supplied from an essential electrical circuit, ie a circuit separate from the normal lift supply and independent of the main isolating switch for the building. In a hospital such a lift should be large enough to accommodate a bed and capable of being controlled by the Fire Brigade with the operation of a key mechanism in the control panel.

To provide smoke free access for fire fighting, pressure ventilated staircases might be required. Basically such a system was an electric fan with distribution duct work through the staircase providing air at each landing, the fan being started automatically by the fire detection system or manually. The term 'pressurised ventilation' was perhaps a little misleading since this suggested that the pressure within the staircase would prevent smoke entry. This was not the case since prevention of smoke entry depended on a continuous outward flow of air away from the staircase.

DISCUSSION

In the course of the discussion sessions at both conferences the following were the main points to emerge:-

1 Evacuation of buildings

It was suggested with some reservations that in certain situations special areas with some degree of security might be set aside outside hospitals into which certain categories of long-stay patients might be easily moved or directed in the event of fire; this could for instance take the form of a walled garden. Types of equipment for use in evacuation were discussed. The technique of removing bedfast patients wrapped in mattresses was not particularly attractive although in units with low staffing ratios this method had often to be accepted. Bed mattress covers of man-made fibres were more satisfactory for moving patients in this way but were relatively expensive if provided on every bed - the number required could be limited by designating certain beds for the non-ambulant patients who would require to be physically moved from a ward area. In this event a plan of everyday patient location would have to be readily available in view of the high turnover rate of nursing staff. Man-made fibre slings could also be used to pull patients to safety but here again levels of staffing were important. In relation

to chutes the general feeling was expressed that these as envisaged at present were not satisfactory and presented additional hazards to safe evacuation. In response to a request for central guidance on the use of chutes in health buildings, it was indicated that their use was not likely to be encouraged except possibly in some instances where children or very ambulant cases were involved.

2 Staff education

The importance of educating all categories of staff to the real dangers which existed in buildings as to an outbreak of fire could not be over-emphasised. Undoubtedly a level of complacency existed and an "it will never happen to me" attitude was not uncommon. Regular training of staff in fire drill was important and the organisation of fire seminars, for instance, to discuss the management and leadership roles of medical and senior nursing staff and to see demonstrations of fire appliances and rescue procedures was helpful. The preparation of booklets on fire precautions for distribution to all personnel and instruction as a matter of routine to medical and nursing staff in training should also be encouraged.

3 Doors

The problem of locked doors and consequent difficulties in escape had arisen in many instances of major fires in buildings. A recent survey in a Scottish Region had indicated that some 1600 emergency exits or doors on routes to escape in hospitals were locked and of these only 600 were provided with an adjacent key. There was in many hospital situations no requirement for absolute security and it was the responsibility of authorities to look closely at the situation and ensure that doors were locked only when absolutely necessary. In circumstances where a key was provided this should be readily identifiable in an adjacent glass panel. To avoid fire and smoke spread, doors should ideally be kept closed but from the nursing viewpoint it was desirable to observe patients regularly and particularly at nights to hear any movement. This situation could present real problems in terms of fire spread. Fire resistant doors could be fitted with automatic closers wired into the fire alarm system which would normally hold the door open but allow it to close in the event of fire. This however was an expensive item and had to be provided with discretion. A lightweight fire resistant door with internal honeycomb had also recently been devised and this had some attractive qualities.

4 Fire certificates

It was probable that a Designating Order in respect of hospitals would be issued in due course under the Fire Precautions Act 1971. This would make the issuing of a Fire Certificate essential in respect of hospital property. A Code was in course of preparation and would be issued for guidance. Since hospitals were Crown property, it was likely that certificates would be issed by Her Majesty's Inspectorate of Fire Services although the examination of premises could be delegated to the appropriate Fire

Brigade. It was pointed out that hospitals being complex buildings and of varying ages, there was now a need for authorities to consider areas which were likely to require the earliest attention and to review the responsibilities of their officers in fire related matters.

5 Fire ratings of materials

In view of the variety of materials which were available for use in buildings, the value of a list of fire ratings of items such as paints and a wide range of plastics in use was discussed. This was applicable to numerous items and combinations of materials and although the Fire Research Station could supply information on the qualities of the more commonly used items, with the ever increasing range of materials available, many products and composites undoubtedly required further investigation as to their fire qualities. This was particularly important in hospital wards where patients were more vulnerable to the toxic effects of smoke.

6 Fire alarms and detectors

Different types of fire alarm systems were available and their suitability depended on the type of unit into which they were to be installed. Telephone systems, although still in use in many situations, presented difficulties in relation to dialling confusion in the darkness or smoke, jamming of lines and could frequently be the object of misuse and vandalism. The provision of a suitable fire alarm system in each area was a more satisfactory arrangement and use of the telephone could then be restricted solely for transmitting the source of the alarm. The provision of heat/smoke detectors was not generally felt to be necessary in areas where continual activity took place but should be installed in office-type situations where areas were left unused for lengthy periods.

7 Lifts

Different opinions existed as to the use of lifts for evacuation purposes in the case of an outbreak of fire. Many Fire Service officers mainly due to several fatalities which had occurred, were not in favour of their use, although it was mentioned that with the complexity of health buildings every possible form of escape should be utilised. In a multi-fire zone building, if lifts were situated in a zone not affected by the fire, it was suggested that they could be used for the evacuation of ambulant patients provided that they were powered from a source outside the zone of the fire. Reservations were however expressed on the movement of bedfast patients by lifts. By and large lift systems in most hospitals and other buildings were not adequately designed to carry out this function since it was necessary that enclosed hallways should be provided at lift entrances and other special power and protection facilities provided.

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